

REPORT OF THE
NATIONAL COMMISSION ON
AGRICULTURE

1976

PART XII
SUPPORTING SERVICES AND INCENTIVES



सत्यमेव जयते



GOVERNMENT OF INDIA
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PREFACE

The Report of the National Commission on Agriculture comprises 69 chapters in 15 parts. A complete list of chapters and parts is given in pages (iii), (iv) and (v). The Terms of Reference of the Commission and its composition are given in Part I—Chapter 1—Introduction.

This volume entitled 'Supporting Services and Incentives', is Part XII of the Report and is divided into the following three chapters:

55. Credit and Incentives
56. Marketing, Transport and Storage
57. Processing and Agro-Industries

Marketing of fish and fishery products is dealt with in Part VIII.



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CREDIT AND INCENTIVES

1 INTRODUCTION

55.1.1 Besides adequate credit facilities for production and marketing, the farmer needs other incentives and social recognition for the modernisation of the techniques and investment on an adequate scale. The small and marginal farmers will also have to be assisted by the provision of subsidies on a selective basis.

55.1.2 After briefly assessing the progress of institutional financial system in the country, we discuss in this chapter the main components of a new credit policy for financing agricultural development. We recommended in our Interim Report on Credit Services for Small and Marginal Farmers and Agricultural Labourers¹—the organisation of farmers' service societies (FSS)—one for each tehsil/block or any other viable unit of convenient size, for providing on an integrated basis agricultural credit service to the farmer. Easily accessible to small and marginal farmers and landless agricultural labourers, it would provide the requisite credit along with the facilities for its conversion into inputs and services for improving their technology. These societies would be linked at the district level for common services through district unions. These recommendations have been accepted by the Government and are being implemented. In the process of Implementation some changes in the working of these societies have become necessary. In this chapter we deal with these aspects in detail.

55.1.3 We have also assessed the broad magnitude of credit requirements in the agricultural sector taking into account the production and investment needs of all types of farmers. For meeting in full the credit requirements by 1985 an estimated investment of more than Rs. 16,000 crores would be necessary. Since it may not be feasible to raise financial resources of this order, we have worked out a graduated financial programme which could be met by the cooperative and the commercial banking systems. In our view it would be necessary to gear up the financial institutions to be able to cater to

¹Hereafter referred to as Interim Report on Credit Services

these graduated requirements estimated at Rs. 9,400 crores in 1985. By the end of the Fifth Five Year Plan 45 per cent of the 1985 level of graduated requirements of short-term loans and 40 per cent of the medium and long-term loans should be met. In the context of urgent national needs we consider our estimates of credit requirements as per the graduated scale as modest. Therefore, the Reserve Bank of India (RBI) and the Government should immediately initiate planning for business and manpower development in the commercial banking and cooperative systems to equip them for undertaking these operations.

55.1.4 In our view the policy for subsidies should be based upon the principles of selective application. They should be implemented in a manner as to provide incentives to the small and marginal farmers in regard to several inputs and action programmes as well as to promote development and quick growth in particular sectors and key programmes. We feel that intrinsic method of motivation should be relied upon to a greater extent than extrinsic ones like subsidies. We have suggested in this chapter the types of awards and social recognition to be accorded to the farmer for providing the necessary incentive for production.

2 EVOLUTION OF INSTITUTIONAL FINANCING SYSTEM

The Pre-1947 Phase

55.2.1 Efforts to build up the institutional financing system for agriculture commenced with the adoption of the Cooperative Credit Societies Act in 1904. However, during the first three decades of the century, the village money lender was the main source of finance for farmers. Several enquiries and studies such as Sir Malcom Darling's report (1935) and the preliminary and statutory reports of the Reserve Bank of India (1936 and 1937) emphasised the fact that almost the entire farm advance was supplied by money lenders at usurious rates of interest. Various measures for debt relief and control of money lending were tried; this covered statutory reduction of amounts due, fixation of maximum rates of interest, mortgages and the protection of the agriculturist and specified items of his property against legal proceedings.

55.2.2 The Government made deliberate attempts to nurture the cooperative movement, to institutionalise efforts to relieve farmers from the traditional burdens of debt and to promote thrift. Gradually they assumed a more positive role as compared with their earlier cha-

characteristics of organisations for defence against exploitation of money lenders. There was not only a steady quantitative expansion in numbers but also a growing diversity in the functions assumed by cooperative societies. However, credit societies pre-dominated in the cooperative system. Till 1947, the general thinking was in favour of promoting multi-purpose primary societies in rural areas. During the period 1947 to 1956, cooperatives were recognised as an instrument of planned economic action and the cooperative system was considered more suitable than the Government departmental agencies, for administration of farm credit.

All India Rural Credit Survey (1951—54)

55.2.3 The All India Rural Credit Survey (1951—54) brought out the fact that in spite of various procedural and administrative reforms as well as statutory credit facilities from the Reserve Bank of India (RBI), the cooperative system could account for only 3.1 per cent of the total borrowings of cultivators. The cultivators continued to depend on the money lenders and the traders for more than 70 per cent of the estimated requirements. The report recommended that lending policies should be geared to production programmes, and an integrated scheme should be evolved to link together credit, marketing and processing in the cooperative sectors. It also suggested, that there should be increased State assistance and guidance (including State partnership in cooperative credit institutions) and that large sized societies covering areas providing adequate business should be organised.

Large-sized Societies

55.2.4 Initially, a target of establishing about 10,000 societies was set for the Second Plan period. However, this policy was modified and reviewed several times during the subsequent years. For the programme for cooperative development for 1957-58, schemes for revitalising existing small societies and establishing new societies were included. The National Development Council (NDC) recommended in 1958 that cooperatives should be organised on the basis of village community. In fact, there was almost a complete reversal of policy when it was decided that the formation of further large sized societies should be stopped from April, 1959.

Revised Policy 1960

55.2.5 An attempt was made to restore the emphasis on viability when the Government appointed an expert committee in 1959 (Chair-

man Shri V. L. Mehta) to consider the question of viability, provision of adequate finance and State participation in primary cooperative societies. On the basis of the resolution of NDC and the recommendations of Mehta Committee, a revised policy was announced in October, 1960. According to this, the village community continued to be the primary unit for organising new cooperatives; however, within maximum limits of a population of 3,000 and radius of four miles, other villages could be covered in the interest of viability. State Participation in the share capital of primary credit society was permitted up to the level of Rs. 5,000 per society. Further, in order to encourage lending to the weaker sections, outright grants were allowed to primary societies at 3 per cent and to central banks at 1 per cent on annual increase in advances. The schemes for development of cooperative credit during the Third Plan period were drawn on the basis of these policy decisions. The Plan envisaged that the membership of primary cooperative societies will increase to about 37 million. It was estimated that the total amount of short and medium-term credit may increase to about Rs. 530 million and the outstanding loans of long-term credit to about Rs. 150 crores. Actual achievements however fell short of the targets to some extent. The membership of primary agricultural societies increased to 28 million at the end of the Third Plan. The amount of short and medium term loans advanced by these societies touched the figure of Rs. 490 crores at the end of the Third Plan and those of long-term advances (loans outstanding) Rs. 120 crores. However, in the subsequent years there has been a sizeable increase in the membership of primary agricultural societies to 35 million in 1970-71 and 38 million in 1972-73. The estimated loan business of these societies in 1973-74 and the targeted levels for 1978-79 are of the following order.¹

(Rs. crores)

Item	Estimated business in 1973-74	Targeted level in 1978-79
Short-term advances by primary agricultural societies	700	1,300
Medium-term advances by primary agricultural credit societies during the five years of the Fifth Plan	200	325
Long-term advances by the land development banks during the five years of the Fifth Plan	900	1,500

¹Draft Fifth Five Year Plan, Vol. II: 79, Table 3. Planning Commission, Government of India, New Delhi.

Multi-purpose Cooperative Organisation

55.2.6 An important feature of the 1960 policy as also the earlier recommendations in 1958 of the NDC was the emphasis on multi-purpose role of the village primary cooperative society. Much earlier the All India Rural Credit Survey Committee (1952) elicited the views of the State Cooperative Departments on the effectiveness and success of the multi-purpose cooperative societies. This survey had come across several instances of efficient and well managed multi-purpose societies meeting the varied needs of the rural farming community particularly in Tamil Nadu, Maharashtra, Andhra Pradesh and Punjab. In November 1958, the NDC in its Resolution on Cooperative Policy, also recommended that the responsibility and initiative for social and economic development at the village level should be placed fully on the village cooperative and the village panchayat which were to be considered as the primary agencies for improving all aspects of rural life through the efforts of the people. The Revised Policy in 1960 envisaged that the primary societies at the village level will promote the economic interests of its members in accordance with the cooperative principles and seek to achieve this aim by activities in different directions. In other words, it was expected to be a multi-purpose organisation which will provide loans to its members, promote savings among them, supply them with agricultural requisites and domestic requirements and arrange for the marketing of their agricultural produce. Multi-purpose cooperative societies never became a reality on a national scale due to a variety of reasons related to will and capacity. Too much emphasis was laid only on credit aspect, often to the neglect of other service functions. Further, in organising multi-purpose societies their viability was not always taken into account. Sometimes, it was assumed that the multi-purpose societies would be viable even at the village level. Moreover, the multi-purpose societies were not backed by adequate skills as well as technical extension and other supporting services.

55.2.7 The NDC observed in 1958 that conditions should be created so that every rural peasant and worker would be attracted to join the village cooperative. They recommended that the *taccavi* loans and other facilities from Government should be made available to the cultivators only through the cooperatives. The Government of India appointed a committee in July 1961 (Chairman Shri B. P. Patel) to recommend measures for full implementation of these suggestions from the NDC. On the basis of the recommendations of the Patel Committee, Government of India declared that cooperatives

were to be ultimately the sole institutional agency for provision of agricultural credit. The policy of routing *taccavi* loans was proposed to be implemented in a phased manner. In order to enable them to take over the entire responsibility of the provision of agricultural credit, the programme of strengthening primary cooperatives was again emphasised.

Viability Re-defined

55.2.8 The Conference of State Ministers of Cooperation held in June, 1964 recommended that a viable primary cooperative society should be able to: (a) afford a full-time, qualified and paid secretary as well as a regular office; (b) contribute to reserves on the required scales; and (c) pay a reasonable return on capital. The Ministers also recommended that action should be taken for amalgamation or liquidation of weak and moribund societies, identification of viable and potentially viable societies and planning of credit and non-credit business required for a society to become viable. They also wanted special provisions to be made to enable cooperative societies to admit as members all classes of cultivators including marginal and sub-marginal cultivators and landless tenants. Provision of outright grants on additional advances at the rate of 3 per cent for primary societies and 1 per cent for central cooperative banks was also brought into force. These rates were fixed respectively at 4 per cent and 2 per cent for financing of agriculture in Intensive Agricultural District Programme (IADP) districts. These outright grants were to be credited to special debt reserves.

Introduction of Crop Loan System

55.2.9 The next stage of development in the national policy for cooperative credit system was marked by the introduction of the crop loan system and an Action Programme in 1963 for implementation by the State Governments. The Action Programme emphasised that:

- (i) credit should be production oriented and the amount of loan should be determined on the basis of the needs and repaying capacity;
- (ii) credit for inputs should be disbursed in kind;
- (iii) the timing of disbursement and recovery should be in line with the seasonality of agricultural operations;
- (iv) societies not likely to become viable should be re-organised through amalgamation and defunct societies should be liquidated.

- (v) simultaneously quick studies should be undertaken to locate potentially viable societies and initiate action to make them viable in a specified period;
- (vi) the central cooperative banks should be strengthened to improve their operational efficiency and enable them to fulfil their responsibility of supervising primary societies;
- (vii) marketing should be intensified and organically linked with credit programmes;
- (viii) overdues should be controlled and procedures dealing with defaulters should be made more operative; and
- (ix) primary credit societies should increase their share capital and collect compulsory thrift deposits.

It was also recommended that adequate staff should be appointed both in cooperative departments and the credit institutions. Various measures were initiated during the Third and Fourth plan periods to implement the Action Programme. These included rationalisation of the credit structure at primary level resulting in liquidation or amalgamation of about 1 lakh primary societies, rehabilitation of weak central cooperative banks and State participation in their share capital with the help of Long Term Operations Fund of the RBI.

All India Rural Credit Review Committee

55.2.10 In order to make a comprehensive review of the total credit system for agriculture including processing, storage and marketing, the RBI appointed the All India Rural Credit Review Committee in July 1966 (Chairman Shri B. Venkatappiah). The Committee was requested to look into:—

- (i) working of the crop loan system, with special reference to access to inputs;
- (ii) progress in respect of the establishment of Agricultural of India group in respect of agricultural financing and the potentiality of using the rural branches;
- (iii) progress in respect of the establishment of Agricultural Credit Corporation and other measures recommended by the Reserve Bank of India's Informal Group on Institutional Arrangements for Agricultural Credit; and
- (iv) measures to achieve coordination between extension and development agencies on the one hand and financial agencies on the other.

55.2.11 The Venkatappiah Committee came to the conclusion that the non-institutional sources still accounted for 81 per cent in total

agricultural credit in 1961-62 as against 93 per cent in 1951-52. As regards the position in 1967-68, the Committee observed that cooperative credit had still not been oriented adequately to production credit needs. It fell frequently short of standard of timeliness, adequacy and dependability. In fact, the cooperative system had remained relatively stagnant in respect of coverage of credit needs as well as borrowing members as a proportion of the total number of members. Generally, the Committee also noted that overdues were not only heavy but they were rising from year to year and small cultivators were still unable to get their share of credit from the cooperatives.

55.2.12 Two important findings of the Committee regarding the organisation for administering agricultural credit also need to be noted. They observed that a large number of primary agriculture credit societies were neither viable nor potentially viable and therefore, could be regarded as inadequate and unsatisfactory agencies for disbursement of production credit. Moreover, the coordination between the agency in charge of staff and extension and cooperative credit institutes, was generally inadequate. The Report made several specific recommendations for the promotion of viable units, rehabilitation of weak central banks and priority attention to areas of retarded growth.

55.2.13 Apart from a number of recommendations to strengthen the existing structure to be able to handle the anticipated rapidly increasing demand for rural credit, the Committee made several suggestions on the organisational network, for supporting the agricultural credit system. These included the following:—

- (i) re-organisation of rural credit function in the Reserve Bank of India including establishment of Agriculture Credit Board;
- (ii) setting up of small farmers development agencies;
- (iii) creation of a Rural Electrification Corporation; and
- (iv) expansion of Agricultural Refinance Corporation.

The Venkatappiah Committee emphasised that special attention must be paid to credit needs of areas not well-endowed by nature and classes of farmers not well equipped to take advantage of modern agricultural practices. In spite of impressive quantitative growth at all-India level, the cooperative credit system had made slow progress in several parts of the country such as Assam, Bihar, Orissa, West Bengal and Jammu & Kashmir.

Government's Role: Supporting System

55.2.14 The cooperative structure has undergone various stages of growth modification with active intervention, support and assistance

from the Government. The process was facilitated by periodical review of progress at expert level, revision of policies and procedures, legislative measures as well as financial, administrative and technical support. The cooperatives also have been receiving substantial financial support from the Central and State Governments, RBI and other financing institutions by way of share capital, managerial subsidies and contributions to bad debts reserves. In this context, the establishment of the Long Term Operations Funds and the National Agriculture Credit (Stabilisation) Fund by the RBI in 1956 could be considered measures of vital importance. The Long Term Operations Fund was established for the following purposes:—

- (i) loans and advances of State Governments for a maximum period of 20 years for subscription to share capital of cooperative credit institutions;
- (ii) loans for a period of 15 months to 5 years to state cooperative banks for agriculture purposes;
- (iii) loans to central land mortgage banks up to a maximum period of 20 years; and
- (iv) purchase of debentures of central land mortgage banks.

55.2.15 The National Agriculture Credit (Stabilisation) Fund has to be used exclusively for medium-term loans to state cooperative banks to enable them to convert their short term credit into medium term credit when it becomes necessary to do so as a result of natural factors affecting agriculture. Credit stabilisation funds are also maintained at the state cooperative banks and the central cooperative banks and they are assisted by the Central Government through the State Governments to augment these funds. Moreover, both the State and Central Governments provide grants for rehabilitation of weaker central cooperative banks according to specific schemes. Moreover, debentures issued by state cooperative land development banks are purchased by Reserve Bank of India, public sector banks, Agriculture Refinance Corporation* (ARC) and Life Insurance Corporation (LIC). In addition, the cooperatives also enjoy various concessions regarding taxes and stamp duties.

55.2.16 Considerable administrative, supervisory and technical support is given to the cooperative system. The Registrar of Cooperative Societies in each State and his staff exercise both departmental and statutory functions. Technical assistance in formulation and implementation of various projects is also given by the other departments of the State Governments dealing with ground water, irrigation, agriculture, animal husbandry, etc. The Agriculture Credit Depart-

*Now redesignated as Agricultural Refinance and Development Corporation.

ment of the RBI provides the strongest organisational infrastructure support to the cooperative system by way of supervision and guidance for expansion. Moreover, the Agricultural Refinance Corporation which was set up in 1963, plays a vital role in helping cooperatives and commercial banks to expand their term lending, by way of assistance in project formulation and appraisal as well as refinance.* In addition, the National Cooperative Development Corporation (NCDC) provides basic infrastructure and stimulus for promotion of marketing processing and storage activities related to agricultural inputs and produce.

Commercial Banks

55.2.17 Until the introduction of social control and nationalisation, the official policy was to use the cooperative system as the best suited channel for institutional credit for agriculture. In fact some pioneering efforts of commercial banks to go into agriculture financing were questioned and discouraged at one stage. The commercial banks on their part have experimented with a number of alternatives and combinations of methods and approach in different parts of the country, with varying degrees of success. They include building up of a base of field officers and extension officers, organising Agricultural Finance Corporation Ltd. on a consortium basis for project formulation and consultancy services on financing and implementation, developing expertise at head offices, group financing, adoption of villages, organising agricultural development branches with special personnel and facilities financing through primary cooperatives and, to a very limited extent, making a beginning with farmers' service societies as proposed by us in our Interim Report on Credit Services.

55.2.18 The performance of both commercial banks and the cooperative system in recent years, their constraints for extensive coverage of small and marginal farmers and the need for new policy horizons and organisation for effective coverage of the weakest section of farming community to have reasonably easy access to credit inputs and services, are examined in the next Section.

*The major areas of lending refinanced by ARC are minor irrigation, land development, for utilisation of major irrigation facilities, soil conservation and development of plantations. Allied activities like dairy, poultry mechanised fishing will receive greater attention in the Fifth Five Year Plan period in the northern, southern and western zones, whereas, the emphasis will be on ground water exploitation in central, eastern and north-eastern zones. The Corporations operations in the Fifth Plan period are expected to increase from Rs. 317 crores in June 1974 to Rs. 900 crores.

3 ACHIEVEMENTS AND LIMITATIONS

Cooperatives and Commercial Banking Systems

55.3.1 Both institutional and non-institutional agencies have been meeting the requirements for farm credit. The combined share of cooperative and commercial banking systems has however not exceeded 40 per cent of the estimated requirement. Direct finance for agricultural development from the cooperatives went up from Rs. 488 crores in 1969-70 to Rs. 610 crores in 1973-74 in the case of short-term loans and from Rs. 52 crores to 125 crores during the same period in respect of medium and long-term loans. The direct financing of agricultural development by the banking system has also shown signs of improvement in the recent years, for instance short-term outstanding loans were of the order of Rs. 107 crores in 1971-72 and improved to Rs. 188 crores in 1973-74. In case of medium/long-term loans the outstandings improved from Rs. 184 crores in 1969-70 to Rs. 235 crores in 1973-74. Appendix 55.1 gives the position in respect of institutional finance for agricultural development available/outstanding during the years 1969-70 to 1973-74.

55.3.2 The National Credit Council observed that in 1967-68 the institutional credit agencies met only about 38 per cent of the estimated credit requirements for agriculture. There was only a marginal improvement in this proportion by 1973-74. As compared with the estimated requirements of Rs. 4,000 crores for that year, as formulated by the All India Rural Credit Review Committee, the institutional credit agencies provided Rs. 1,537 crores including Rs. 919 crores (23 per cent) from the cooperatives and Rs. 618 crores (15.4 per cent) from the commercial banks. It is, therefore, incumbent upon the two major systems to plan expansion of the lending capacity and performance on a much more ambitious scale and even to explore and adopt new strategies, linkages and methods so as to achieve a notable improvement in servicing this gap of over 60 per cent between total requirements and availability of credit. The Fifth Plan targets for agricultural credit aggregate to Rs. 5,400 crores, in which the share of the cooperatives is fixed at Rs. 3,125 crores and that of the commercial banks at Rs. 975 crores.

55.3.3 The primary cooperatives have been the principal agency for agricultural credit and will continue to play that role. The total amount of credit advanced by cooperatives increased from Rs. 23 crores in 1950-51 to Rs. 203 crores in 1960-61. The short term and medium term loans advanced by primary cooperative credit societies

was Rs. 342 crores in 1965-66, Rs. 488 crores in 1969-70, Rs. 515 crores in 1970-71, Rs. 534 crores in 1971-72, Rs. 576 crores in 1972-73 and Rs. 610 crores in 1973-74. The membership of agricultural cooperative credit societies has increased from 17 million in 1960-61 to 26 million in 1965-66, 30 million in 1969-70 and 31 million in 1970-71. Short and medium term credit for agriculture from the cooperatives is targeted to reach the level of Rs. 1,625 crores (Rs. 1,300 crores in short term and Rs. 325 crores in medium term loans) by 1978-79.

Long Term Credit from Cooperatives

55.3.4 As regards the long term credit, the land development banks which have made significant progress in recent years, were considered to be well-organised to handle loan operations of over Rs. 1,000 crores over the Fourth Plan period. However, a lower target of Rs. 700 crores was fixed, on the basis of financial resources then in sight. Between 1960-61 and 1968-69 the loans advanced by these banks to agriculturists increased from about Rs. 12 crores to Rs. 148 crores and the loans outstanding to them from individual members from 38 crores to Rs. 402 crores. The quantum of fresh long term loans issued were: Rs. 155 crores in 1969-70, Rs. 170 crores in 1970-71, Rs. 154 crores in 1971-72, Rs. 169 crores in 1972-73 and Rs. 184 crores in 1973-74. The target for long term loans through the cooperative system by the end of the Fifth Five Year Plan i.e. 1978-79, has been fixed at Rs. 1,500 crores.

Share of Small Farmers in Cooperative Credit: Earlier Findings

55.3.5 We have already quoted¹ in our Interim Report on Credit Services, earlier findings regarding the tendency of cooperative credit to flow mainly towards larger cultivators. These include the findings of the All India Rural Credit Survey Committee (1952), All India Rural Debt and Investment Survey (1961-62) and the All India Rural Credit Review Committee (1969). Over large parts of the country, smaller farmers have been handicapped in having access to cooperative credit both for current inputs and viable investment.

Rising Overdues

55.3.6 Another disquieting feature of the cooperative credit

system have been the rise in the overdues from year to year, as will be seen from Table 55.1 below:—

TABLE 55.1
Percentage of Overdues at the Level of Primary Societies and
District/Central Cooperatives Banks

Year	Overdues at the level of primary societies (%)	Overdues at the level of district/central cooperative banks (%)
1960-61 . . .	20	12.4
1967-68 . . .	32	24.7
1968-69 . . .	35	27.0
1969-70 . . .	38	29.0
1971-72 . . .	44	35.9

The increasing overdues have not only affected the ability of the co-operatives to extend further credit but have also put in doubt the credit worthiness of the cooperatives themselves.

55.3.7 The Report of the RBI Study Team on Overdues of Co-operative Institutions (1974), highlights various contributory causes for this situation such as deficiency in lending policies, especially inadequate and untimely credit and over-financing; lack of supervision; over-use of credit; fixation of unrealistic due dates; unjustified remissions on *taccavi* loans and local unwillingness to develop the climate and culture for timely repayment.

55.3.8 The benefits of the cooperative lending system flowed mostly to bigger farmers, contrary to what was intended and stressed in various reviews, because of the following factors:—

- (i) Land-ownership came to be the dominating criterion both for admission of new members and extending credit. Gradual liberalisation of scales of finance, particularly for cash crops, resulted in significant increases in the total volume of credit out of line either with increases in borrowing members or acreages served.
- (ii) Cooperative leadership and management were in the hands of the bigger farmers who were both unwilling and unable to appreciate the needs of the small and marginal farmers.

- (iii) The principle of the lending being geared to the possible increase in income generation could not be applied for a large coverage of small farmers; apart from selfish local leadership, the system lacked technical expertise and operational efficiency needed to implement this principle. Whatever credit that reached the smaller farmers, was also mostly used unproductively since coordination between credit agencies and supply channels for inputs and services (to enable smaller farmers to convert credit into inputs) was hardly operative.

Financing by Commercial Banks

55.3.9 Although the banking system took certain steps for achieving the objectives of social control and welfare, the progress made in this regard was not adequate. In order that banks were adequately motivated towards a speedy achievement of the social purpose, particularly for meeting the legitimate requirements of the weaker sections of the society, 14 major scheduled banks were nationalised in July, 1969. Since then, the commercial banks have made major strides in respect of financing agriculture. They have emerged as a major source of agricultural finance along with the cooperatives. Agriculture in general is no longer considered a commercially unfeasible proposition. Outstanding advances of scheduled commercial banks have increased in the last four years from Rs. 188 crores in June, 1969 to Rs. 618 crores in June, 1974. There was a corresponding increase in the number of agricultural loan accounts which touched the level of Rs. 16.08 lakhs by December, 1972 and Rs. 18.06 lakhs by December, 1973. Statewise details are given in Appendix 55.2. The six States namely, Maharashtra, Uttar Pradesh, Tamil Nadu, West Bengal, Andhra Pradesh and Karnataka account for 65 per cent of the outstandings. Agricultural lending accounts for 9.4 per cent of the total credits of the scheduled commercial banks as at the end of December, 1973. Fifty per cent of the agricultural lending is direct to the farmer, 20 per cent is to the plantations, 7 per cent is for allied activities and the balance represents indirect finance to corporations, etc. for supporting services for agriculture (Appendix 55.3).

55.3.10 Commercial banks now have a first hand experience of financing agriculture and activities directly supporting it, at least in respect of holdings operating under conditions of more or less assured water supply and access to urban markets (particularly in the case of financing of dairy, poultry, horticulture and vegetable cultivation).

This process has been facilitated by growth of indigenous capacity for production and supply of farm inputs and equipment as well as by important breakthrough in agricultural research and their adoption.

Village Adoption and Agricultural Development Branches

55.3.11 Several of the scheduled commercial banks have adopted a strategy of concentrating on compact areas and extending their business of agricultural lending along with financing of related activities, on the basis of intensive programmes of area development. One variation of this strategy is the village adoption scheme. The public sector banks adopted about 960 villages, a majority of which, are being served by the State Bank of India and its subsidiaries. This approach combines the advantage of economy in operating costs with creation of a visible impact on the local agricultural and other activities in the adopted villages. Other banks also have followed this approach in different ways including selection of certain branches as centres for compact integrated area development. In addition, the State Bank of India has tried another strategy: 134 agricultural development branches have been established at selected centres of good potential for agricultural financing with adequate technical and managerial base for promoting and nurturing agricultural lending in the respective hinterlands.

Financing through Primary Cooperative Societies

55.3.12 Initially, a scheme for financing agriculture through primary credit societies was taken up by the commercial banks at the instance of the Reserve Bank of India in six States, viz., Andhra Pradesh, Haryana, Madhya Pradesh, Karnataka, Uttar Pradesh and Orissa. It has now been extended to cover four more States, viz., Bihar, Jammu & Kashmir, West Bengal and Maharashtra. The commercial banks have advanced short term loans of the order of Rs. 12 crores and medium term loans of Rs. 80 lakhs for kharif 1973 and rabi 1973-74. No loan has yet been given under the scheme in Maharashtra and Bihar. In addition to being able to reach a much larger number of farmers through this method, the banks have gained valuable experience in selecting societies, reviving them as cooperative bodies financially and organisationally and in guiding them to expand membership, share capital and lending on healthy lines.

55.3.13 An analysis of agricultural lending by the public sector banks as on March 30, 1973¹ brings out two features of interest

¹ Reserve Bank of India Bulletin, April 1974.

Firstly, nearly 60 per cent of this amount is for term loans (Appendix 55.4). Secondly, farmers having holdings above 2.02 ha have got 74 per cent of the total credit from this source.

TABLE 55.2

Percentage Share of Small and Big Holdings in Agricultural Credit from Public Sector Banks, as on March 30, 1973

Share of holdings	Percent of total		
	Short-term advances	Term loans	Total
1. holdings up to 2.02 ha			
(a) by number of accounts	69	36	54.4
(b) by amount	45	17	26.0
2. holdings above 2.02 ha			
(a) by number of accounts	31	64	43.6
(b) by amount	55	83	74.0

55.3.14 In respect of short term advances, *i.e.*, crop loans, 69 per cent of the accounts pertain to holdings up to 2.02 ha, with a not too niggardly share of 45 per cent in amount. Big holdings had 55 per cent of the amount. The banks did make a conscious effort to have a proportionately extensive clientele of small holders. But they were financed on the usual per hectare basis. The average outstanding amount of short term advance comes to Rs. 900 per account of holdings up to 2.02 ha as against Rs. 3,500 per account in the case of others. This sounds 'normal', if acreage is the basis of financing. Obviously, the commercial banks did not consider the small holding accounts as a special class; prevailing practices ran counter to considering cultivating rural households as units of enterprises, requiring a dose of credit in multiple of 'normal' scale, to use their small holdings most effectively for intensive agriculture with high yields.

55.3.15 In respect of term loans, accounts of holdings up to 2.02 ha were 36 per cent in number, with only a share of 17 per cent in the amount.* The average outstanding for term loans was

*This is in sharp contrast not only with the 'small holdings' share in crop loans but with the overall pattern of term loans being more important (Paragraph 55.3.13—Table 55.2).

Rs. 2,165 per account for the small holdings as against Rs. 6,161 for the others. Operational convenience and conventional ideas on 'safety' and on proper utilisation of assets created by term loans, seem to have influenced the relative proportions heavily in favour of the larger holdings.

55.3.16 In the interest of keeping our perspective clear, it may be useful to note the fact that the number of loan accounts in agriculture with the commercial banks is just 3.4 per cent of the cultivating rural households as estimated by the National Sample Survey.*

Small Farmers and Institutional Financing Agencies

55.3.17 The small and marginal holdings in India form 70 per cent of the total operational holdings, but account for only 21 per cent of the area.¹ In this skewed distribution of land holdings, the new agricultural technology having largely benefited the bigger farmers, has tended to add to the disparity between the more privileged and the less privileged in the rural sector. 'While the handicaps of such (small) farmers differ from area to area, the major disadvantages they suffer from are fragmentation of holdings, inadequate and untimely supply of inputs and water, insecurity of tenure, lack of sufficient credit facilities and unsatisfactory arrangements for marketing and storage'.²

55.3.18 Both the cooperatives and commercial banks lacked the understanding and ability to tackle the special needs of small farmers, let alone those of marginal farmers and agricultural labourers. We have already indicated in paragraph 53.3.6 how a combination of difficulties in the cooperative system proved detrimental to extension of its benefits to small farmers. At this juncture we also note the constraints under which the commercial banks have had to work so far, which inhibited efforts to cover small and marginal farmers more extensively. In the initial period, they tended to follow the prevailing criteria and methods of selecting borrowers and financing them. Operationally, preference for bigger accounts was also a concomitant result of the various constraints under which they worked e.g. rigid salary structure, shortage of personnel with competence and aptitude for this business, slow progress in delegation of powers, unhappy experience of target-based but otherwise unplanned lending and rela-

*i.e., about 1.8 million accounts by December 1973 out of 53.4 million operational holdings of which 34.4 million were below 2 ha.

¹1975. All India Report on Agricultural Census 1970-71 : p. 26, Table 8.2. New Delhi, Ministry of Agriculture and Irrigation Government of India.

²1970-71. Towards Growth With Social Justice, Budget Papers—Government of India,

tively high cost of processing and post-lending activities for a large number of widely spread small accounts. With a number of innovations in policy, strategy, organisational structure and operations, they have now been able to reach the present level of 18 lakhs accounts and outstandings of over Rs. 600 crores, with very heavy strain both on their manpower resources and profitability. Apart from organisational problems peculiar to either of the two systems, the other problem was related to conventional, land-based norms of security. The system proved to be inadequate for extending productive assistance to small farmers to help them to come out from conventional farming to adopt modern farming and ancillary occupations.

The Need for New Policy Horizons and Organisations

55.3.19 Both on grounds of equity and optimum use of manpower and land, it is necessary to subsume the small and marginal holdings into the national programme for modernisation and development of agriculture. The institutional financing agencies have assisted to the best of their abilities the process of adoption of new agricultural technology by the relatively well-placed and influential farmers. Within the constraints of their structure and resources as also the patchy help that they could get from development departments, institutional financing agencies have also tried to encompass the small and marginal farmers within their business operations. However, what they have been able to achieve, falls far short of the totality of what is needed at the national level. The crux of successful financing of small and marginal farmers lies in the gearing up of a comprehensive organisation for planning their production, introducing subsidiary occupations, planning investments for improvement and diversification of productive capacity (both on a collective and individual basis) and organising inputs and services as well as processing and marketing on a joint basis. It is difficult to visualise how the institutional financing agencies alone can undertake such a mammoth responsibility.

55.3.20 If the goal is maximum possible coverage of small and marginal farmers for upgrading and modernisation of agriculture over the next ten years, the first necessity is a ground level organisation fulfilling two criteria. Firstly, it must facilitate the conversion of credit into inputs and services as well as realisation of a fair price for the produce. The credit is to be looked upon as an integral and facilitating element of a chain of activities needed to organise small and marginal farmers into a local nucleus of rural development. Secondly, it must operate fully on a commercial basis, covering all the needs

of the farmers and combine local knowledge, initiative and leadership with financial discipline. This suggests a strategy of combining the strong points of the cooperative structure at the ground level, with the strong points of the commercial banks. It is necessary to evolve a system which takes full advantage of local knowledge, initiative and leadership of a cooperative, with the organising capacity, planning experience and skills of financial management available with the commercial banks. Such an organisational set-up will operate the new policy for agricultural development as well as financing as spelt out by us in the next section.

4 MAJOR COMPONENTS OF NEW CREDIT POLICY FOR FINANCING AGRICULTURE

55.4.1 Towards the conclusion of the preceding section, we have very broadly indicated the lines on which the transfiguration of the present system of institutional finance has to be designed and put through. Ultimately, what is needed is a national network for integrated credit service for extensive modernisation of agriculture, fully utilising the experience, talent and resources already available with the cooperative and commercial banking systems. It is necessary at this stage to enunciate what we consider to be the core of a national agricultural development policy and an 'appropriate' agricultural credit policy that would emerge therefrom. Such an enunciation would provide the foundations for the goals, structure, operational norms and design of working relations for the new system. We shall, therefore, discuss in this section our approach to the role of credit policy in agricultural development, the main facets of such a policy and the general role of the institutional financing agencies in the interim period. The organisational set-up, structure and working norms for 'FSS will be spelt out in the next section.

Agricultural Development and Credit Policy

55.4.2 The national agricultural development policy rests on the principles of planned modernisation, maximisation of output based on full utilisation of land and manpower (including that represented by the majority of rural households in the lowest income and asset groups) and equal access to opportunities for agricultural development to all classes of farmers. An effective credit policy must aim at bringing about deliberate changes in the following areas, to assist and accelerate the processes postulated by the overall agricultural development policy.

55.4.3 The new strategy of agricultural development introduced on a field scale with effect from 1966-67 was based on the application of science and technology to agriculture. This technology was area based and was neutral to scale. However, the medium and bigger farmers who were innovators and who had the necessary resources or had access to the requisite resources were the first to reap the benefits of the new strategy. In order that the small and marginal farmers have also their share of the benefits, it should be the objective of policy that they should be provided with the requisite resources by way of credit, inputs, technical know-how etc. It is only through the provision of these resources that the small and marginal farmers can be helped to solve the problems of poverty, unemployment and under-utilization of their resources and potentialities. To that end, we had mooted the concept of the FSS with emphasis on integrated credit, input supply and marketing facilities in our Interim Report on Credit Services.

55.4.4 The previous system resulted in concentration of resources in the higher asset group by virtue of their accumulated influence and assets, as well as ability to command credit for equipment and current inputs through their asset-based creditworthiness and ability to use know-how. The system did not permit extension of the opportunity to use know-how or skills and command purchasing power to procure scarce inputs, to the less fortunately endowed cultivators who are in a numerical majority.

Institutional Credit—Existing and New

55.4.5 The existing institutions need to be equipped to be able to serve the majority of small farmers, with appropriate internal changes and new external linkages. So far, either the local elite wanted to monopolise most of the institutional aid (as in the case of cooperative credit institutions) or it was considered 'safe' and practical to lend to the well-placed farmers first, to gain experience, confidence and fulfilment of targets without major changes in organisation and policy, as it happened in the case of financing by commercial banks.

55.4.6 It is our intention that the proposed integrated credit service and concentration of institutional and government inputs on small farmers, should produce significant improvements in both the counts on which they are at present the lowest status rural cultivators, viz., (a) possession of modicum of land and capital, and (b) poor control and participation in transformation of inputs into produce and in getting the benefits of development.

55.4.7 The new institutional credit system should make it possible that the flow of credit and inputs which have been hitherto going to larger farmers on a favoured basis are equitably shared between the large and small farmers.¹ To the extent that the availability of institutional credit for agriculture is limited in relation to need, priority would have to be given to the needs of the small farmers since their more happily placed counterparts have access to credit on normal commercial terms from banks and also past surpluses lucratively deployed elsewhere.

Basic Goals of New Policy

55.4.8 Before spelling out the major components of the new credit policy, we should like to indicate its three basic objectives. Firstly, it should provide a total system for building up and expanding all activities facilitating the modernisation of agriculture, including organisation of services and marketing and improving its productive capacity. Secondly, it must have a comprehensive connotation of 'agriculture' to make it almost co-terminus with rural development, covering all production needs of rural households. Thus its scope covers cultivation and dairying, livestock rearing, fishculture, sericulture, forestry, etc. as well as marketing, transportation and processing necessary for conversion of input into outputs and cash incomes at fair prices. Thirdly, it must facilitate and provide for linkages between finance and services for current inputs as well as for investments in land development, wells and pumpsets and farm equipment. It is only through the latter that there can be an expansion of the basic capacity to produce and to adopt improved practices and take risks attached thereto.

Economic Viability

55.4.9 The first principle that the new agricultural credit policy must satisfy is that all activities financed under its aegis, for individual enterprises or projects, must have actual or potential financial viability. Anticipated extra income on the basis of farm plans, would be a main base for lending decisions under such a policy. It is in this sense that the farm plan or the enterprise plan would both be a credit document and a document of education for the borrowers and

¹"A basic identity now exists between measures required to achieve adequate and sustained agricultural growth and those needed to secure substantial progress towards a more just and efficient rural structure." (Tarlok Singh, 1974. *India's Development Experience* : p. 195. The Macmillan Co. of India).

the lenders. When necessary the credit policy will have to be supported by organisational efforts to generate viability either by modification or the selection of activities or securing economies and advantages through pooling of requirements for more than one enterprise or project. The bank resources as well as budgetary resources that are to be used as capital investment and working capital must generate over an identified period, adequate flow of income for repayment of loans as well as for upgrading the status of the people for whom it is meant.

55.4.10 The real test of the effectiveness of the new agricultural credit policy would lie in the extent to which it induces and helps the institutional financing agencies to develop a system which progressively improves accessibility of credit and inputs to small and marginal farmers and helps them to move from subsistence level activities to surplus earning operations.

Integration of Credit and Services

55.4.11 There should be single source of institutional credit that the farmer need approach for all his credit requirements. Financing of agricultural entrepreneurs should be done on the principle of viewing the credit needs of individual farmers in their entirety—covering both current as well as investment operations. The local banking unit, which may be either a branch of a cooperative or commercial bank would deal with short term, medium and long term requirements of the local farmers. In addition, it would provide working capital to farmers having medium or long term loans from land development banks. Operationally, this would mean that commercial banks could lend to small farmers for purposes needing stretching of repayment up to 12 years, when such lending is eligible for refinance from ARC or other financial institutions interested in long term investments in rural development on commercial basis. The repayment period for loans should not be automatically fixed by the conventional category of the scheme or activity financed e.g. medium or long term loan. The actual repayment period may even be much shorter than the normally prescribed period if the anticipated cash flows indicated this possibility. This has been already emphasised in the guidelines for agricultural financing issued by the Reserve Bank of India.

Inter-Agency Coordination and Integration

55.4.12 Two aspects of the integrated credit services should be emphasised as policy goals. Firstly, there should be close integration

of financing plans and lending between different agencies operating in the same area. This inter-agency collaboration may take various forms such as agreed lending norms, broad division of functions in terms of supporting activities for which different agencies have different degree of experience and capacity, collaboration between commercial banks and primary cooperative societies, etc.

55.4.13 The second aspect of the integration pertains to integrating supply of credit with the organisation and management of supply of inputs and services for which credit was, in effect, extended. At present these two functions are being looked after by two different agencies leading to problems of coordination in the field. Instead it would be desirable to entrust both the functions to the same agency at the field level.

Financing of Medium and Large Farmers

55.4.14 For the bigger and medium farmers, the commitment of the institutional financing agencies would be to ensure that necessary credit facilities would be available promptly on normal commercial terms for all requirements related to expansion of output and adoption of modern practices of farming; including improvement of land, minor irrigation and acquiring of equipment and machinery, which would help in extending the cultivated area, introduction of multiple cropping and more generally, improvement in productivity and output. On the part of the Government, they will be given due attention to ensure that there is a minimum possible obstruction in the movement and distribution of inputs and farm outputs so that it becomes difficult for anybody to make a profit out of market imperfections and scarcities. They too can purchase the inputs from and market the outputs through the new agencies.

55.4.15 The bigger and medium farmers will be subject to the same discipline as all other borrowers in commercial and industrial sectors, as far as the assessment of need, requirement of supplementing borrowing with own resources, rate of interest and modalities of repayment are concerned. Both on the grounds of equity and fuller utilisation of resources, it would be only just and fair to give small farmers first priority for all concessional facilities and even subsidies on a temporary basis. The credit policy would make it clear that it is not its intention to disrupt the production activity in the large and medium farming sector by unrealistic squeezes on the flow of credit in order to accommodate the needs of the small farmers. In order to enable the small farmers to catch up with the previous lag, weightage should be given to their needs and credit should be extended on

preferential terms both in regard to interest charges and quantum of advances.

Integration of Cooperative and Commercial Banking Operations

55.4.16 The original distinction between the administration of farm credit through the cooperative system and through the commercial banks has lost its *raison d'être* because of two reasons, viz. (a) both the systems will have to adopt a uniform approach as regards the lending policies and procedures for medium and large farmers and (b) they will also have to have a new strategy and approach to provide integrated credit services for the small and marginal farmers. In fact, we would recommend that in respect of sources of funds, statutory rights as financing institutions over defaulting borrowers, power to supervise and give directives to the borrowers for appropriate use of credit etc., the commercial banks should enjoy the same authority and facilities as the cooperative banks *vis-à-vis* their role of financing primary cooperatives. Statutory amendments may be necessary to permit commercial banks to be eligible to the same facilities as the State cooperative banks according to Section 17/2(B) of the Reserve Bank of India Act.

Control of Default with Continuity in Production

55.4.17 It should be an accepted principle that credit for on-going activities for the next season should not be withheld due to delay in repayment connected with crop failure or unexpected market fluctuations. No land should be driven out of effective cultivation as a consequence of suspension of credit facility for one or more reasons. Certain facilities like conversion of short-term to medium-term loans in case of crop failures, protecting the farmers from impact of price fluctuation by extending credit to enable them to hold on to stocks are already being provided in the cooperative system. It is necessary to widen the scope of such measures in the interest of credit supplies to the small farmers on a continuing basis and to give them a fair deal.

Graduation

55.4.18 An important aspect of effective credit service is that it should help the farmer to reach a self-sustaining stage as regards the requirements for working capital over a period of 5 years or so. Bank credit enables individual farmers to 'graduate' to self-sufficiency for

working funds and enable them to plough back surpluses to operate on a higher level of technology or increased intensity of cultivation over a reasonable period. This objective can be realised by encouraging farmers to open running accounts with the banks. Otherwise, bank credit would be monopolised by the early adapters; assured of continuous renewal of limits for working capital, they would use surpluses (after repayment of loan) not for reduction of demand on the credit agency but, for other purposes including money lending. This principle needs to be adopted by the lending agencies strictly.

55.4.19 The main basis of this recommendation is the thought that the same area being tilled in the same way and producing the same output cannot continue to claim the same or more seasonal credit year by year, if access to credit is to be provided to more and more people. At a given level of technology and output credit should generate over 5 to 7 years adequate surpluses to finance about 70 per cent of normal working capital requirements. Such a ceiling should not, however, imply capital expenditure not being supported by the institutional credit agencies as land improvement was a continuing process. There should be some amount of discrimination and flexibility in the matter of advancing finance for the process of agricultural development. From the angle of national policy, it is important that such surpluses are ploughed back by the farmers reducing their demands on available institutional funds rather than being deployed in private money lending.

55.4.20 The principle of graduation will not be converted into a rigid formula of scaling down 'eligibility' for credit. If it is related to a tonne of expected output rather than to a unit of area under cultivation, there is no danger of its application preventing adoption of intensive cultivation (needing more outlays on inputs). In the first instance, it may be applied to the bigger farms, say 4 hectares and above, under irrigated conditions. Two precautions need to be taken in doing so, viz. (a) the credit system should be more liberal in respect of purchased inputs than financing of bullock labour and farm labour and (b) even the big farmers should not be denied the normal liquidity requirement to the tune of almost 30 per cent of all cash expenses.

Financing of Dry Land Farming

55.4.21 It is important that credit should not be a constraint for adoption of new cropping and tillage patterns developed for unirrigated areas depending solely upon rainfall. It is felt that in areas

receiving an average rainfall of about 51 cm. and above, it should not be difficult to make agriculture a commercially feasible proposition using a combination of practical experience and research results. The credit agencies may have to help the agriculture departments and other extension agencies in making the farmers understand the financial implications of dry farming technology. At the same time, through their own studies, they need to build up the *modus operandi* for financing dry farming for specific enterprises and specific areas.¹ The operating unit in the case of dry farming may be much bigger than the small farm, for successful adoption of new technology and its financing. On the other hand, in the case of the small farm, the emphasis will be on intensive land use for higher cash yielding produce. Moreover, in the rainfed areas variations in yields from year to year are unavoidable. At the same time, the adoption of new technology leads to much higher yields over a period of time. It is this aspect of profitability over a period of years that has to be built into the system of financing the new technology in the rainfed areas. One of the measures necessary to do this is to provide adequate medium term carry-over finance to tide over bad years.

55.4.22 For dry farming the lending agencies would ultimately get involved in term lending for:—

- (i) soil conservation and land development, improvement of physical and biological characteristics of the soil;
- (ii) adoption of water harnessing procedures to store as much of the precipitation as possible for use of crops;
- (iii) equipment for better tillage for improving soil structure and root penetration as well as deep placement of fertiliser and foliar feeding;
- (iv) introduction of cash yielding trees and special grasses; and
- (v) appropriate animal husbandry programmes.

55.4.23 The immediate strategy for commercial banks for financing dry farming would be to concentrate on crop loans on a selective basis, i.e. to select farmers willing to try out proven package of practices in national demonstrations, at least, on a part of their holdings. They should be within easy reach of a branch, to maintain close contact and ensure timely use of correct methods and inputs. The banks could then successively encourage such farmers to adopt land development measures, partly out of bank finance and partly from their

¹Krishnaswamy M. S. and K. V. Patel, 1973. The Status of Dry Land Agriculture : Vol. I. The Technology of Dry Land Agriculture in Selected Villages of Bellary and Panchmahals Districts, 1970-71 ; Vol. II, The Economics of Dry Land Agriculture in Selected Villages of Bellary and Panchmahals Districts 1970-71 Ahmedabad. The Indian Institute of Management, and the National Institute of Bank Management.

own surpluses. The normal methods and available experience will have to give way to trials for double crops and mixed crops, replacing longer duration crops and introduction of new crops such as soyabean, high protein maize, macaroni, wheat and cotton of short duration.¹

55.4.24 To sum up, a national agricultural credit policy would promote, extend and intensify modernisation of agriculture through institutional lending. While doing so, it would actively build in and activate such processes as would directly facilitate full use of the land-man resources and entrepreneurship represented by the small and marginal farmers and agricultural labourers with a view to helping them to move *en masse* from below subsistence level to earning surpluses. The two major institutional financing systems, viz., the cooperatives and commercial banks would need to have a common approach and strategy to suit financing policy and practices to special handicaps of small farmers, treat loans to medium and large farmers on commercial lines and make them, subject to 'graduation' and extend operations to rainfed areas on a big scale. At the same time, the new credit policy would seek to operationalise the concept of integrated service to ensure to small and marginal farmers access to inputs, know-how and services, by way of credit administered through a large number of local, multi-purpose cooperative organisations, viz., farmers' service societies. The set-up of these FSSs, their scope, obligations and business policy, the lines on which they will operate, their financial and operational linkage with the financing banks, development agencies and apex lending and re-financing institutions, etc. are discussed in the next Section.

5 ORGANISATION OF CREDIT AND FARMERS' SERVICE SOCIETIES

Multi-purpose Organisation

55.5.1 The discussion in the preceding sections has clearly brought out that the central need of the small and marginal farmers is not merely money, but timely availability of a package of inputs and custom services, along with technical advice and supporting services for storage, transportation, processing and marketing preferably through a single contact point. It is in realisation of this need that

¹M. S. Swaminathan, 1970, April. New Techniques for Dry Land Farming Agricultural Situation in India : 3-5.

we have recommended in our Interim Report on Credit Services the organisation of farmers' service societies—one for each tehsil/block or any other viable unit of convenient size with as many branches as are required in the area to provide the integrated agricultural credit service to the farmers. This service should be made accessible to all small and marginal farmers and agricultural labourers who want to upgrade their technology. We also recommended that there should be a union of FSS at the district level for common services and that the lead bank of the district should assume leadership in the matter of organizing agricultural credit service. These recommendations have been accepted in principle by the Government of India and are being implemented. In the course of implementation certain problems have arisen which needed some modifications of the original proposals within the basic concept and frame work of the FSS.

Main Features of FSS

55.5.2 The uniqueness of the FSS lies in the total responsibility it assumes for agro-rural development and the requirements for the operations of all its members, including small and marginal farmers and local artisans. It provides the element of organisation and joint action that enables the small farmers as a group to overcome the handicaps of smallness. Another fact of its uniqueness lies in an attempt to utilise, to the best advantage, the suitability of the co-operative form of organisation at the ground level and blending it with the business acumen and experience of the commercial bank; the arrangement has the potential of enabling commercial banks to reach a very large number of farmers as compared to the number they can possibly reach by directly approaching individual farmers.

55.5.3 The farmers' service society would be a registered co-operative body, with bye-laws to ensure autonomy, efficient management and freedom from unimaginative or mis-conceived departmental interference. It will have an eleven to thirteen-member board including five representatives of small farmers and two of other members, four nominees of Government, one of the financing bank and the Managing Director. The board will mainly lay down policies and approve of programmes. The day to day administration will be conducted by a Managing Director and it will be his responsibility to implement the policies and programmes approved by the board. The Managing Director will have to be appointed by the FSS in consultation and concurrence of the financing bank.

55.5.4 The financing bank will prescribe the norms and procedures of financing which will be administered by the FSS. Besides,

providing funds to meet the credit needs of the members, the bank will extend various lines of credit to the FSS for its activities regarding supply of inputs and services. It will have access to the FSS's records and accounts and will have authority to call for the statement of accounts at regular intervals.

55.5.5 The State Government will need to give active support and help to the FSS by way of quick registration, nomination of the first board of Directors in consultation with and concurrence of the financing bank, contribution of share capital between Rs. 50,000 to Rs. 1,00,000 per society, subsidising the FSS for expenses on technical and extension services and generally cutting red-tape for enabling the FSS to serve small and marginal farmers, agricultural labourers and artisans without procedural delays and bottlenecks.

Constitution and Bye-laws

55.5.6 Each FSS will be registered as a cooperative society under the cooperative societies' Act of the concerned State. These bye-laws differ from the usual bye-laws for primary cooperatives in two important aspects. Firstly, there is a major departure in terms of objects, jurisdiction and the 'say' or initiative to be exercised by the financing bank which is meant to be the lead bank (which, by present arrangements would be a commercial bank although an equally competent district central cooperative bank is not ruled out). The statement of objectives in the model bye-laws covers in detail the credit function along with the business of inputs and services, storage, marketing, processing and undertaking of construction works. The jurisdiction extends to certainly more than one village, possibly eight to ten initially and subsequently in the whole block with provision for branches. Further, the financing bank has now been given an active role, as explained in paragraph 55.5.3.

55.5.7 The second significant departure concerns the separation of policy and programme-making functions of the board of Directors from management and administration of the FSS. The latter will be entrusted to a Managing Director selected by the financing bank. Contrary to the earlier practice, the Managing Director will also be a member of the board.

Functions

55.5.8 The major functions of the FSSs should be as follows:—

- (i) Each FSS will have a broad plan of agricultural and re-

lated development in its area of operation; it will assist individual members within the framework of such a plan and overall programme to achieve it.

- (ii) All the credit requirements of the members including term loans will be met by the FSS.
- (iii) For short-term loans, the FSS will receive applications, process them and sanction the loans for disbursement in kind or by cheques on the local or nearest branch of the financing bank, according to the guidelines laid down by the financing bank. The financing bank will serve the members through a bulk loan or cash credit facility to the society.
- (iv) The FSS will also give medium and long term loans; the financing bank will provide the funds to the FSS and get subsequent refinance from term lending agencies, such as the ARC.
- (v) The FSS will take up the business of supplying inputs and services at reasonable prices, so that credit gets converted into inputs and repayment is ensured by way of having a direct influence over the use of credit. The scope of this function will include artisans and entrepreneurs of rural industries.
- (vi) The FSS may directly enter marketing or may enter into a contract with a special produce marketing society, such as milk marketing society, in handling the produce of its members.
- (vii) If this role is to be fulfilled, the FSS will have to hire land and equipment for cultivation as well as plant protection and also arrange for veterinary services.
- (viii) Another important service that the FSS is expected to render is to take up construction of wells, minor irrigation works, godowns and even roads, for its members as well as for local authorities, to fill the gap in the availability of services at reasonable cost and reliability.
- (ix) The FSS will provide credit to the members of functional production-cum-marketing cooperatives for dairying, livestock rearing, sericulture, etc. operating in the districts and have appropriate linkages with them as recommended by us in our Interim Report on Credit Services.

In discharging its functions, the FSS should take care of all the development needs of small and marginal farmers and agricultural labourers, village artisans and persons rendering rural services.

Organisation

55.5.9 The basic steps in the organisation of an FSS are indicated in a chart in Appendix 55.5. They include the care with which the area of operation should be selected, the intensive efforts needed for initial promotional activities to reach all the small and marginal farmers and many of the labourers and artisans, as well as the procedural discipline to be observed before and after registration. Although this chart is based on the actual experience of financing banks in promoting FSS, it holds good for any other agency or even group of local people wanting to start an FSS. An important feature of the entire concept is that FSS should function on the principle of economic viability. It is envisaged that with some financial support in the initial years, the societies will become viable from about sixth year of functioning.

Sources of Funds

55.5.10 The FSS will derive its share capital from members and the State Government. The members, particularly marginal farmers and agricultural labourers, will also be eligible for loans from State Government for share capital. Each State Government should be granted correspondingly loans from the Long Term Operations Fund of the RBI, to expedite their share capital contribution to the FSS being launched in their State.

55.5.11 The working capital of the FSS will be drawn from the following sources:—

- (i) credit lines from the financing bank, for all loans to individual member as well as for the entire gamut of service activities;
- (ii) sales proceeds and charges for services collected from members;
- (iii) reasonable trade margins on inputs;
- (iv) contribution from financing bank for the emoluments of Managing Director and from State Government for salaries of extension staff;
- (v) all subsidies for which individual members are eligible under on going Small Farmers Development Agency (SFDA), Marginal Farmers and Agricultural Labourers (MFAL) schemes;
- (vi) all subsidies including that for fund, promotion of fertilisers and storage activities available under various schemes of the National Cooperative Development Corporation;

- (vii) commission and fees from marketing organisations such as marketing societies; and
- (viii) margins on loan representing the difference between the lending and borrowing rates.

Linkages and Multiplier Effect

55.5.12 An integrated agricultural credit system based on the concept of credit service, economic viability and development of borrowers to self-sufficiency for working funds would invigorate the process of capital formation in the rural economy; it would facilitate both resource mobilisation and investment. The FSS should develop close business relationship with other bodies such as land development bank and various corporations. For example, agro-industries corporations have been set up in several States with the objective of providing means for modernising agricultural operations and undertaking distribution of agricultural machinery and other inputs and also to provide services of all kinds. These corporations should act as promoters and initiators of processing industries keeping in close touch both with each service society and their district union. The Food Corporation of India and commodity corporations could also render assistance and use the district union of the FSSs as their agency for procurement, storage and despatch of their purchases.

55.5.13 We, therefore, recommend that institutions like land development banks, State agro-industries corporations, the Food Corporation of India, etc. should play a vital supporting role in offering services to farmers to absorb credit for productive purposes. In this connection, we suggest that proper linkage should be developed between the credit structure envisaged by us and these agencies. The network of immediate linkages of an FSS as visualised by us is indicated in Appendix 55.6.

The Role of the Financing Bank

55.5.14 The general relationship between the FSS and the financing bank will be on the pattern of client-banker relationship in the current national context. The bank will not only be concerned with the profitability and safety of its lending to an FSS in the narrow sense. It will have a direct say in the deployment of funds released to the FSS, to ensure their safety and utilisation for the purpose for which they are intended. Besides laying down the basic procedures for lending, credit administration and repayment of loans, it will have a right to be continuously informed about the major financial tran-

sactions and decisions of the FSS, and to advise (and even to direct when necessary) the FSS to plan its growth on healthy lines. The banks would have an overall stake in their growth as a special type of institutional clients which have a key place in the national policy for agro-rural development.

55.5.15 The financing banks will have to temper their enthusiasm and anxiety for financial discipline to ensure that the FSS does not become merely a convenient institutional device for disbursement and recovery of bank credit. In addition to the financial business, banks will have the social responsibility of helping FSSs in various ways to grow essentially as farmers' own organisations in which not only the smaller farmers and labourers are well served but in fact have the prominence of influence and control.

55.5.16 There should be a union of FSS at the district level for mutual consultation and coordination of policies of the FSS in the district. It may be found that various types of expertise, especially storage, purchasing, processing and marketing required by the members are best organised at the district level. Where such services can be organised jointly on a viable basis and the FSS consider that they must be jointly involved in organising these services, the district union can take over this function on behalf of the FSS. Where the purchase, marketing and processing of any agricultural produce assumes large proportions in the district, in any particular commodity like cotton, oil-seeds, etc. it may be desirable to establish a separate functional cooperative organisation at the district level, for each of such commodities instead of the general district union taking up this work. Depending upon the area and its needs, FSS's activity may grow on different lines. For instance, as recommended, in our Interim Report on Milk Production through Small and Marginal Farmers and Agricultural Labourers "FSS at the tehsil/block level may undertake the responsibility for extending short and medium term credit for the purchase of milch animals for all the members of the primary village dairy cooperative societies". These primary village dairy cooperatives may be linked up directly with the functional cooperative organisations or a corporation at the district level. A close organisational and functional link up would thus have to be established between the three agencies (namely, the primary dairy cooperatives, the FSS and the functional cooperative organisation) in regard to advancement and realisation of loans. Where separate functional unions do not exist, the FSS Unions may start with one or two specialised activities of marketing and processing and gradually cover other needs.

Role of State Government

55.5.17 The State Governments are major partners in the promotion, extension and consolidation of the new credit policy and in ensuring that the FSS is fully supported and helped by the administrative and extension set-up in their control. Every State Government has the basic responsibility of maximising agricultural output and employment and ensuring that the land-man resources represented by small and marginal farmers and agricultural labourers are fully utilised in the process. They are committed to trying out all alternatives for providing small and marginal farmers guaranteed access to resources and know-how to produce more and up-grade their economic status. Therefore, they should play a triple role and shoulder responsibilities as outlined below:—

- (i) Promoting a policy of equal facilities and administrative support, e.g. from Cooperative Department, ground water exploration organisation etc. to efficient central cooperative banks as well as commercial banks. The State Planning and Development Department should identify districts and parts of districts where the cooperative credit system has not been effective so that the commercial banks could help new FSS in those areas.
- (ii) Contribution to the share capital of each new FSS to anywhere between Rs. 50,000 to Rs. 1,00,000 and also bearing the salaries of the technical extension staff for the first three years. The share capital contribution should be related to the borrowing capacity required by each FSS for the next three years (according to its business plan and projections) and expected collection of share capital from members.
- (iii) Rendering necessary policy guidelines to the respective Registrars of societies and Cooperative Department to rationalise the operation of rules, improve effective accountability of societies but reduce routine reference for Registrar's approval and above all, to direct them to assume a positive and dynamic promotional role.

Role of Cooperative Departments

55.5.18 We recommend that State Governments should direct and encourage Registrars of cooperatives to:—

- (i) assist the promoters of new FSS in identification of areas in consultation with the lead bank/Cooperative Central Bank of each district;

- (ii) assist the new FSS for promotion of new membership with adequate liaison with Revenue Departments, SFDA, and MFAL authorities to ensure coverage of small and marginal farmers;
- (iii) introduce quick processing of applications for registration of new FSS according to model bye-laws for FSS;
- (iv) change procedures to improve service and reduce delays;
- (v) develop working understanding with the financing bank on operational matters, appointments in FSS and requests of the FSS for relaxation of restrictions on borrowing powers on specific occasions;
- (vi) have close understanding with the promoters and the financing bank regarding nomination of the first board of Directors to ensure adherence to the spirit of the bye-laws; and
- (vii) give periodical feedback to State Government and initiate modifications in the Act and Rules for cooperative societies, to suit the business-like working and development of FSS.

Extension Services

55.5.19 Extension support will have to be extended by the FSS in all the disciplines of agriculture, namely, crop, husbandry, livestock rearing, dairying, sericulture, pisciculture, farm forestry etc. whichever is necessary in the area of operation. In the field of crop production the services required would relate to advice regarding the choice of cropping patterns, water management and crop planning for optimisation of production in relation to water resources. We have already indicated the type of extension support needed by the farmers in other disciplines in our Interim Reports on the following subjects:—

- (i) Milk Production through Small and Marginal Farmers and Agricultural Labourers.
- (ii) Poultry, Sheep and Pig Production through Small and Marginal Farmers and Agricultural Labourers for Supplementing their Income.
- (iii) Sericulture.
- (iv) Social Forestry.

It is necessary to have a clear demarcation of the functions of the extension services and those of general planning and development agencies. The work of planning the infrastructural development is

the responsibility of the Chief Agricultural Development Officer (CADO). The guidance on issues such as what types of investments would pay should come from the planning agencies. These programmes should be within the overall plan frame. In matters of financial analysis and market guidance the societies would have to be supported by the banking system. Farm service centres for repair and maintenance of light mechanical equipment, for cultivation and crop protection as well as for hiring out equipment to small farmers should also be looked after by the FSS or the State agro-industries corporation.

55.5.20 The organisation of technical and managerial-financial extension activities is a vital condition for the success and cumulative growth of farmers' service societies. The proposed framework for agricultural administration has been explained in detail in Chapter 62 on Administration.

55.5.21 In our view, the State departments should shed their direct involvement in services and inputs supply and instead concentrate on coordinating these activities to ensure that inputs reach the farmers in time and in adequate quantities. Technical aspects of programme formulation and implementation and continuous testing of their effectiveness are also the responsibility of the State departmental agencies. Technical expertise/services could also be available to the farmers through higher level extension organisations of Government institutions. Private experts running consultancy services and research/extension organisations of suppliers of inputs (viz. fertilisers, seeds and pesticides) could also provide these services on payment basis.

55.5.22 In areas served by FSS the extension service should be the concern and responsibility of the society. The group of technical experts of the departments at the taluk/tehsil level should help the extension cadre of the FSS in technical matters. There would be no need in these areas for a separate departmental extension agency. If these extension personnel are the employees of the FSS and are responsible to it for their performance the extension service will develop the necessary involvement alacrity and responsiveness to local needs. Necessary guidance and professional support will also have to be extended to the extension arm of FSS by the State Departments of agriculture, animal husbandry, dairying and other allied disciplines.

55.5.23 As already mentioned in the foregoing paragraph, the FSS at the block level should have the benefit of extension services at that level. Initially the existing departmental personnel could work with the societies on deputation basis. However, the

FSS agency would have to develop its own cadre with various hierarchical tiers so that the right type of personnel get attracted for serving the societies. A reasonably long-term view would have to be taken in matters relating to service conditions and personnel policy so that the employees of the society get opportunities for advancement of career with the growth in the system. Once such a hierarchical and logical structure is developed, the deputationists can be either absorbed in the new structure or returned to the department after arranging for filling up the posts in the new cadre.

55.5.24 FSS has been visualised as a cooperative enterprise capable of meeting its objectives and providing integrated development service to its members fully out of its own earnings. The economic features and business potential to farmers service societies, both block size and small size, have been examined in Appendix 55.7—Statements I and II. It would be observed that in the sixth year both type of societies would become viable. It is possible that viability level may be reached earlier in the case of large size societies say from the fourth or fifth year. In the initial period the salary of the Managing Director and of the extension personnel might have to be met by the financing bank or the State Government.

55.5.25 The total business of the FSS is to be planned in such a way that from about Rs. 5 to 10 lakhs in the first year, it reaches Rs. 25 to 30 lakhs in the third year and over Rs. 50 lakhs by the sixth year. The credit business and earnings therefrom will account for 45 to 50 per cent of the total and inputs and services will contribute the other half. The basic strategy for reaching a stage of viability and generation of surpluses is based on four elements viz. integration of supply of *all* the productive needs of farmers for cultivation and allied activities; selection and adequate jurisdiction, thrust for adoption of improved practices and high yielding varieties and other programmes and build-up of share capital out of successive cycles of incremental income from the use of the integrated credit service by the members.

Share Capital and Funds

55.5.26 Building up of share capital is a very crucial aspect of the development of the FSS. To achieve that end we would recommend the following measures:—

- (i) State Government contribution of share capital should
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- be of the order of Rs. 50 thousand to Rs. 1 lakh, to build in the requisite borrowing power of FSS for growth of business planned for the first year and projected for the subsequent two years;
- (ii) each FSS must attempt to have at least 1,000 to 1,250 members with a share capital of Rs. 40,000 to Rs. 50,000 to start with. The annual target for new membership will also need to be of the order of 1,000. Moreover, for the first 5 to 6 years, each borrowing member will buy one or more shares at the end of every season or year, to bring up his share capital contribution to the society in line with the facilities enjoyed;
 - (iii) subsidies received on behalf of individual eligible members from SFDA, etc., should be credited as margin money or share capital; and
 - (iv) the deployment of share capital money and reserve funds for the business of the FSS will be such that it reduces the burden of interest on loans but is not used for acquiring unnecessary capital assets of ostentatious value.

Maximum Borrowing Power

55.5.27 In the cooperative system the ceiling to the line of credit is related to share capital to encourage healthy growth, emphasize the value of building-up share capital and discourage irresponsible borrowing beyond the handling capacity of the borrowing institution. (This is in addition to the limitation regarding non-overdue cover). However, this provision needs to be used with due care to ensure that it does not depress the prospects of new institutions to start with a line of credit adequate to secure a minimum initial business. In this connection we make the following recommendations:—

- (i) the maximum borrowing capacity of an FSS should be related to the production requirements of the members to be served and fixed and working capital required for its programme of services. To prevent unrealistic demands, the financing bank will satisfy itself regarding the justifiability of the demand and the capacity of the FSS to handle the total programme;
- (ii) the Registrar of Cooperative Societies will relax the statutory limitation on the borrowing power, promptly

to be effective for the financing season, at the request of the FSS supported by the bank. He would, however, stipulate the corresponding desirable increase in share capital, to be collected from borrowing members at the end of each season out of additional earnings and from new members, to ensure growth of own resources in step with expanding commitments; and

- (iii) the FSS on its part will not make share capital contribution (beyond what is statutorily required for membership) as a pre-condition for determining the amount of the loan to individual members; this will be strictly related to the purpose and repaying capacity expected to be generated by the loan. However, it will insist upon proportionate contribution to share capital, as an obligation of each member at the post-harvest/post-sales stage, when the benefit of the loan has materialised.

55.5.28 We strongly recommend that the business of each FSS should be so planned, developed and monitored so as to reach the stage of absorbing all valid costs and earn a surplus by the sixth year. This requires rigorous cost control and managerial efficiency on the one hand and charging reasonable but adequate profit and fees for services on the other. The operations of the FSS are to be expanded in manageable blocks, proceeding village by village, rather than scattering them over a large number of villages. The activities of the members also need to be planned to give them maximum earning capacity. If these two conditions are satisfied, the society will be able to charge and recover a fair price for its services without difficulty.

Managerial Efficiency

55.5.29 The Managing Director and his team (which will eventually be composed of around 20 persons) will be managing lending business of the order of at least a medium sized branch and input business of Rs. 15 lakhs to 25 lakhs and services with equipment which will eventually run into lakhs of rupees. In order to ensure a minimal initial efficiency and its increase along with the growth of the FSS is achieved, we make the following recommendations:—

- (i) the financing bank should lay down the basic system of accounts, budgeting and administration at the start, with subsequent help to modify it as required;

- (ii) the Managing Director must be selected on the ability to develop and manage a large and growing rural business rather than agricultural expertise or urban banking experience. He should be helped to grow on his job by suitable short inputs of institutional training and study visits;
- (iii) the general personnel policy and salary structure should be formulated on a reasonably long-term basis and should allow employees opportunities for advancing with the growth in system; and
- (iv) at all stages of business planning and review, the FSS team must institutionalise a process of continuous consultation regarding the timing and composition of services offered, so that resources and time are not wasted on what the people do not need or are not ready to use or try out.

Diversification of Business

55.5.30 The FSS will not restrict itself to land based cultivation activity alone. It will, on the other hand, be the sole agency for taking care of all the development needs of the weaker sections of the farming community either directly or by special arrangement with other agencies. Each society will perform *inter-alia* the following functions:—

- (i) It will process and sanction applications of its members for short, medium and long-term advances and obtain a cash-credit line for the required amount, from the nearest designated commercial bank branch to finance its other activities such as purchase and storing of inputs, consumer articles, etc.
- (ii) It will either itself undertake supply of inputs, custom and repair services, marketing of produce, sale of consumer goods, etc., with bank finance; or it may enter into contracts with other agencies, firms or individuals (including agriculture/animal husbandry/engineering graduates and diploma holders) for ensuring availability of such supplies and services.
- (iii) It will encourage provision of facilities for developing subsidiary occupations like livestock rearing, dairying, farm forestry etc. particularly to marginal farmers and agricultural labourers.

Diversification of business is important both from the point of view of business and for increased income by better use of manpower and land resources. We have recommended in our Interim Report on Reorientation of Programmes of Small and Marginal Farmers and Agricultural Labourers' Development Agencies, the re-orientation of several production programmes for supplementing the income of the small and marginal farmers and agricultural labourers. This re-orientation generally conceives the creation of functional cooperative societies at the district level. These functional societies would have to develop a close liaison with the FSSs and their district unions so that necessary financial support would be available to the cooperative structure for the production envisaged in these spheres. In the case of milk production through small and marginal farmers etc. we envisage that the FSS at the tehsil/taluk level will undertake the responsibility for extending short and medium term credit for the purchase of milch animals for all the members of the village dairy co-operative societies. There will have to be a close organisational and functional link-up among these primary societies, the FFS and the functional cooperative organisation for milk production at the district level. In the case of poultry production the farmers cooperative societies at the block or tehsil level created for organising production would have to develop a close liaison with the FSS so that the latter could take care of short and medium term credit requirement while the production cooperatives would undertake the recovery of loans from sale proceeds. The re-orientation of sheep development programmes envisaged the establishment of sheep breeder's-cum-wool marketing cooperative societies at the primary level to cover every phase of activity of sheep production and marketing of wool and/or mutton. These primary societies will be federated into a union at the district level. As in the case of poultry production a suitable liaison would have to be developed by this cooperative structure with the FSS for ensuring flow of short and medium term credit. In the case of pig production programmes, formation of producers'-cum-marketing cooperatives have to be established to look after functions like distribution of breeding stock, supply of balanced feeds, collective marketing of pigs, extension of services and provision of animal health cover. We have also recommended in our Interim Report on Sericulture the establishment of functional cooperatives for developing the sericulture industry in selected areas. These cooperatives should get their finances from a single source for the entire chain of operations. Sericulture can be included as one of the items in the list of

activities of the FSS. The viable programmes of farm and social forestry could also be financed by the FSS. The general strategy being suggested by us is thus that strong linkages will have to be developed between FSS and the functional cooperatives for different production programmes to ensure an integrated package of credit services, inputs and extension support to the participating farmers.

55.5.31 In addition to the activities mentioned above, there will be some activities of regional significance which will be sources of additional business for the local FSSs. These include sericulture, financing of certain works related to preparation of land in command area of major irrigation projects etc.

The Immediate Role of the Reserve Bank of India

55.5.32 Following our Interim Report on Credit Services for Small and Marginal Farmers and Agricultural Labourers, the RBI convened a meeting of representatives of commercial banks in June, 1973, to decide the banks' programme for adoption of the FSS model and also to give basic assurance of policy and operational support to take care of the initial hurdles. As the central banking authority which has designed, monitored and continuously nurtured and modified the credit system for agriculture to meet changing national needs, we recommend that the Reserve Bank of India should now take immediate steps in the following matters, as a logical extension of its historic role of guidance, development and control:—

- (i) evolving a unified system of RBI assistance to institutional financing agencies for medium and long-term agricultural credit out of the National Agricultural Credit (Long-term Operations) Fund and the National Agricultural Credit (Stabilisation) Fund, so as to make commercial banks financing farmers service societies, eligible for such assistance on the same footing as cooperative banks;
- (ii) assisting banks to formulate and implement a programme of selective launching and development of FSS, State by State, so as to regenerate the lead bank concept; and
- (iii) integrating the total structure for financing agriculture and rural development from ground level upwards right up to creation of an agricultural development bank of India as the apex organisation.

Unified System of Assistance

55.5.33 The National Agricultural Credit (Long-term Operations) Fund was established in February 1956 for the following purposes:—

- (i) long term loans and advances to State Governments up to 20 years to enable them to subscribe to the share capital of cooperative credit institutions;
- (ii) medium term loans (15 months to 5 years) to State cooperative banks for agricultural purposes;
- (iii) long term loans and advances to central land mortgage banks up to 20 years; and
- (iv) purchase of debentures of central land mortgage banks.

55.5.34 The National Agricultural Credit (Stabilisation) Fund was established in June 1956 for making medium term loans and advances to state cooperative banks to enable them to convert their short term credit into medium credit whenever such conversion becomes necessary as a result of drought, famine or other natural calamities.

55.5.35 Both these Funds were established in terms of the provisions of the Reserve Bank of India (Amendment) Act, 1955. At that juncture, the official policy was to use the cooperative credit system as the only channel for institutional credit. This is no longer so. On the contrary, both the cooperative banks and commercial banks now need to follow uniform norms, policies and procedures for financing medium and large farmers on the one hand and are under equal pressure of national expectations to provide integrated credit and development service to small and marginal farmers on the other. The basis for the historical distinction between the cooperative credit institutions and commercial banks, for assistance in the area of agricultural financing, thus no longer exists. We, therefore, recommend that necessary amendments should be made in the Reserve Bank of India (Amendment) Act, 1955 to enable commercial banks to enjoy the same facilities as the State cooperative banks for medium term loans and advances and conversion of short term loans through the National Agricultural Credit (Long Term Operations) Fund and the National Agricultural Credit (Stabilisation) Fund, since both these institutions are equally involved in financing agriculture in various ways including through FSS.

55.5.36 Further, we recommend that releases of loans out of the Long Term Operations Fund to State Governments for contri-

bution of share capital of FSSs, should be immediate on applications from the concerned State Governments. The only conditions to be fulfilled by the State Governments would be completion of registration formalities of the FSSs (for the share capital of which the loan has been asked for), and undertaking to bear the expenses of the technical extension personnel of the FSS for the first three years. The Cooperative Department of the State Government will take necessary measures to have other primary credit institutions in the area absorbed into the FSS as its branches, or by amalgamation, liquidation, etc. But this should not be made a pre-condition for the issue of the loan from the Long Term Operations Fund as such a measure would have deterrent effect on the launching of new FSS. In fact, the financing bank, local people promoting the FSS and the cooperative department would have already gone into the question of existing 'functioning' or moribund primary credit societies before application for registration. The existence of ineffective local societies controlled by a small number of local people cannot be allowed to hold up progress. The question of 'killing' any progressive or competent primary cooperative will not arise as a new FSS would be ordinarily planned around such a local institution as the nucleus unless it has blatantly excluded small and marginal farmers from its membership.

55.5.37 We should like to emphasise that in the interest of increasing productivity, area development approach was necessary in agriculture. Under such an approach all sections of the farming community have to be suitably supported in their economic activity so that they could make the necessary contribution in the overall production drive. The first essential task is, therefore, one of drawing up programmes for development of agriculture on an area basis, followed with an assessment of the overall credit requirements of the various sections of the farming community to implement such programmes. Such an attempt has been made in Section 6 of this chapter. This assessment indicates that the entire credit requirements are not capable of being met within the time perspective envisaged due to the financial constraints in the institutional credit structure. A revised programme has been prepared for meeting the credit requirements on a suitably graduated scale. Such graduation has been effected keeping in view minimal goals of production set in the perspective up to 1985 and the national policy objectives of growth with social justice. The task of meeting these graduated credit requirements has to be faced squarely by the banking and cooperative systems. The financing of individual

production programmes has to be done on purely economic considerations. Insofar as the weaker sections of the community are concerned development agencies will have to identify the economically viable programmes to be taken up in various size holdings which could be financed by the cooperative system and the other financial institutions on a commercial basis. Necessary checks and balances would have to be devised to ensure the flow of adequate amount of credit for such programmes through the nationalised banking system. The RBI has already developed devices for regulating the flow of credit to specific fields of economic activity. These devices should be utilised to ensure that in the agricultural sector the credit needs of the small and marginal farmers are adequately met. The lines on which the RBI could assist the commercial banks in building up and managing their programmes and starting new FSS are discussed in the next Section.

6 NATIONAL PROGRAMME FOR ORGANISATION OF FARMERS' SERVICE SOCIETIES

55.6.1 Following our Interim Report on Credit Services over three years ago, the FSS had developed from an experimental or pilot stage into an integral part of the national agricultural development policy. A national programme to implement this facet of the national policy is now overdue. We would, therefore, like to spell out the basis on which such a programme should be developed; and also advise caution in taking up new areas for location of new FSS. Some of the societies organised recently and in haste have not done well. This is because organisations started without building up a new cadre of specially selected and trained men, will not prove to be very effective. They will conform to the outward forms and structures but in their working they may not be different from the previous co-operative institutions. At the same time, a minimum of tempo and speed as well as self-generation for multiplication will have to be built into the programme to make growth with justice a realised dream for the present generation itself.

55.6.2 Even at the cost of repetition, we would like to recapitulate the essence of the FSS concept first, to keep our sights clear for evolving the national programmes. We would then briefly review the initial experience of launching of farmers' service societies in the last two years and keeping this experience in view, spell out our

recommendations regarding the national programme. Finally, the education and training efforts needed for ensuring the success of the programme will be indicated.

Main Features of the Farmers' Service Societies Concept

55.6.3 FSS are intended to be organisations run by the farmers themselves to provide an integrated credit service. It might be emphasised that the FSS concept is not that of a "reformed" primary credit cooperative society to provide financial backing and facilities for the weaker sections of the farm community or even an improved institutional device created by the banking system to undertake agricultural financing more extensively than direct financing. In the FSS concept credit service is but a part of an integrated package of services. The functioning of the FSS should have the following characteristic features:—

- (i) They will have a compact area of 10—20 villages with a potential of reaching a business of Rs. 25 to 30 lakh in three to five years. Bigger FSSs with branches may touch the level of Rs. 1 crore in business in five to seven years.
- (ii) They will plan their business on the basis of an overall strategy of agro-based development for the area to utilise land and man-power to the maximum extent within the limitations of physical and technical constraints.
- (iii) The FSS will provide all types of credit and assistance needed by their members; they in turn will have appropriate business linkages with financial, industrial, commercial and service organisations to meet the needs of its members.
- (iv) They will be open to all farmers (including small and marginal), agricultural labourers, rural artisans and persons rendering rural services for membership and services. Credit and other services actually availed of by them, will be the acid test of the 'openness'.
- (v) The weaker sections of the farm community (*i.e.*, small and marginal farmers, agricultural labourers, rural artisans etc.) will have a decisive voice in the management of the society. This is of particular significance for two reasons namely, (a) the needs of these sections of the farm community were largely overlooked in the past and (b) overall agricultural development cannot proceed unless

this section of the farm community move from subsistence to a commercial economy. Particular care has, therefore, been taken to lay down in the bye-laws of the societies provisions to achieve this end.

- (vi) The FSS will provide technical and commercial extension service for its members, to ensure use of financial and material help to better advantage. A realistic programme for adoption of modern technology and new crops and activities will be introduced after understanding the smaller farmers' hesitation and constraints.
- (vii) The FSS will be a self-paying proposition including all its costs, within a reasonable time.
- (viii) The FSS would need interim assistance for share capital and subsidy for management and extension services as "seed money", as its major clientele will be from the poorest of rural households.
- (ix) The FSS will have access to the national institutional credit net-work for agricultural and rural development.
- (x) The FSS will accept advice, supervision and directions from the financing bank as a client; the bank will exercise these functions to ensure safety and proper utilisation of funds in line with national policies. In order to ensure proper management and exclude interference from vested interests, the appointment of the Managing Director of the FSS will be with the bank's approval.
- (xi) The FSS will observe all statutory obligations as a cooperative body; since it is no more a mere credit dispensing and recovering agency, the cooperative rules will need to be modified suitably according to its functions with shift in the emphasis from procedural control to performance audit.

Experience of the First Farmers' Service Societies

55.6.4 The initial experience of launching new farmers' societies* is a mixture of break-throughs and well-intentioned compromises fraught with dangers of reviving old problems related to primary agricultural credit cooperatives. Encouraging results have been shown by some of them in respect of membership, share capital, lending, sale of inputs and tractor hiring service. Small and marginal farmers

*Those actually in business and not just registered as FSS. There are six of them in Karnataka, three each in Delhi and West Bengal, one each in Haryana, Bihar, Manipur and Tripura.

have also been enrolled as members. It has been possible to locate and put in position as Managing Directors, relatively young men with adequate commitment, aspirations and ability for their difficult assignment. They have understood the basic purpose of the new programme and have shown quite rapid expansion of coverage and activities including sale of inputs and custom service, with support and detailed guidance from the financing bank. For day to day operations, they have largely proceeded on their own initiative and even shown considerable "risk taking" capacity. They have also managed their local relationships quite well. Further, enlistment of membership and collection for share capital has also been managed extremely well in spite of various local handicaps. The FSS started during the last one or two years have been able to reach a business of nearly Rs. 10 lakhs per year, with a capital base of around Rs. 1 lakh without waiting for State Government share capital contribution. Thirdly, the banks in addition to contributing the services and salary of the Managing Director, have been using their regional as well as head offices for essential activities for the promotion of the FSS, without hesitation.

55.6.5 However, even the more successful of these FSS at best represent isolated pilot experiments to test the workability of the FSS model. Only one bank has thought of building up a separate cadre of Managing Directors through fresh recruitment and training. Basically, these FSS represent bank-created organisations to serve farmers better than before. Under the pressure of showing quick results, the temptation to concentrate on lending and trading is likely to be strong. Although the bye-laws of the FSS provide a very wide range of activities the business priorities have not been clearly evolved. There is a real danger of the Managing Directors getting involved in activities which show quick turnover and good profit, but which are inappropriate at this stage of development of the FSS. There is also the possibility of experimentation of marketing being confined to the produce of a few influential members.

55.6.6 In respect of the composition of the Board of Directors, particularly representatives of small and marginal farmers, greater care and local inquiry will be necessary to debar bogus small farmers and representatives of the old power groups. Reliance on the old leaders has given temporary benefit of getting enough membership, share capital and business from the areas from which they come. Simultaneously, this has also created a threat of revival of the old system of intermediaries between the peasants and the lending institution. If a Managing Director is under pressure in showing quick results and his area of operation is rather large with a few members

in many scattered villages, he is likely to tend to rely on the Directors for various aspects of the FSS business. On the other hand, there has also been a tendency to deliberately select very colourful but good farmers as members of the Board of Directors, who command very little local following or support. In this case, the danger of the revival of intermediaries is taken care of; however, in order to avoid that risk, the FSS becomes virtually a part of the bank's administrative system and not an institutional client of the local people.

55.6.7 Another major cause for concern is that planning of the form and content of extension services and the minimum nucleus needed for making it reach the smallest farmers have tended to be postponable matters, under the stress of building up a respectable size of membership, share capital and business. The focus of attention so far had on who should pay for the extension workers. We understand that in Karnataka, the Government have now agreed to make available one Extension Officer and two Gram Sevaks for each FSS and have made the necessary provisions in the budget. But this makes it all the more urgent that each FSS formulates a strategy and decisions upon the content of extension services and uses such extension personnel to the best advantage. The duties and responsibilities will have to be clearly laid down vis-a-vis those of Government functionaries at this level.

55.6.8 The initial experience also shows that a second look needs to be given to the minimum equipment of the FSS office and the facilities that must be provided right from the beginning. The management of inputs and services as well as maintenance of accounts, needs a compact team from the beginning, working according to a well laid out system. In fact, it would be necessary to plan the work of the total team over the year, with special attention to promotional work and systematisation of internal records during the slack season.

55.6.9 The starting of FSS on a national scale cannot obviously be left to *ad hoc* decisions, accidents of people available as to work as Managing Directors and make shift compromises suiting local exigencies. Under official pressures for quick results, it may be possible to register formally a large number of FSS but they may at best prove to be only restructured primary credit societies working as banks' agencies. Various efforts needed right from the stage of formation, to build them up as farmers' organisations will tend to be indefinitely deferred under the stress of targets for registering new FSS. Constraints of banks in giving intensive attention simultaneously to a large number of new FSS have also to be kept in view.

Requirements of a National Programme

55.6.10 Since the programme for FSS is being taken up on a national scale, following conditions have to be created:—

- (i) while encouraging local or regional adaptation distortion of objectives should be guarded against;
- (ii) individual banks should not be loaded with the heavy strain of organisational work for new FSSs;
- (iii) a special cadre, multiplying its numbers out of its own operations should take the responsibility of forming new FSSs and getting them ready for business; and
- (iv) the cadre should be incorporated preferably into one or more existing organisations with extensive All India experience of agro-based development.

These organisations would take responsibility of managing such cadres, launching new societies and giving consultancy in the initial period of 3 years to them for overcoming the shortcomings. Their services will be paid for on deferred terms, initially by the financing bank, on the basis of the progress of its lending to the FSS over the first five years. Further this organisation can help the State Governments in selecting and training Managing Directors.

Pace of Implementation

55.6.11 The mixed experience of the existing societies indicates the need for caution and proper phasing in the establishment of societies. The spearhead teams should exercise due care in the selection of areas for the new societies. A beginning could be made with only one team of 5 persons as the core. It would attempt to launch 20 societies in one year. The subsequent expected development is shown in Table 55.3 below:—

TABLE 55.3
Phasing of new FSS

Year	Number of teams	Number of team members		Trainees		New FSS to be launched		Resident trouble shooters	
		leader	members	team members	managing directors	new	cumulative at year total end	new	cumulative
1	2	3	4	5	6	7	8	9	10
1.									
3. months	1	1	5						

1	2	3	4	5	6	7	8	9	10
4. months				20+1	20		20	20	
2.	5	5	20	25+5	100	100	120	1	1
3.	10	10	40	50+10	200	200	320	5	6
4.	20	20	80	100+20	400	400	720	10	15
5.	40	40	160	50+40	800	800	1520	20 (15+1+20)	34
6.	50	50	200	..	1000	1000	2520	40 (34+6+40)	68
(for replacement)									

Over a period of 6 years, this cadre would consist of about 250 persons in the spearhead teams and about 68 resident trouble shooters* looking after groups of 20 societies each. They would have thus far launched 2,500 societies and also developed the capacity to form new societies at the rate of 1,000 per year.

55.6.12 It may be useful to start the 5 teams in the second year in 5 different States, for building up the training and laboratory nucleus in different parts of the country. The spearhead teams will be composed of people within the age group 25—30, with a background of agriculture, rural development or cooperatives who are primarily interested in working in rural areas with farmers. The teams will attract the relatively imaginative and daring amongst the young going in for field jobs other than those in banks. The teams will develop and multiply on the basis of the knowledge and skills generated in the course of starting new FSSs by themselves.

55.6.13 Major aspects of preparatory work and decisions to be taken in advance before the first spearhead team goes into action are listed in Appendix 55.8.

Education and Training of FSS teams

55.6.14 In order to understand full implication of the new concept, a closer look at the stated objectives of FSS is necessary. These objectives can be re-stated as below:—

- (i) to identify the needs of the community and formulate programmes of activities of the FSS;

*They will be financial/banking experts conversant with local conditions and will be associated with the Societies to facilitate the sorting out of difficulties encountered by them in their day to day working.

- (ii) to stimulate rural community to adopt new technology and new style and life. Thus, it has to search for innovations and innovators;
- (iii) to continuously search and research for market potential;
- (iv) to keep an eye continuously on the proposed goals and develop feedback system to help it;
- (v) to create and foster new values, orientation in the rural community to keep them in tune with the industrial society; and
- (vi) formulate an employment-oriented development planning for the region.

The Managing Director with a Board of Directors and limited technical staff is to realise the above objectives.

55.6.15 The main thrust of the programme would be on developing necessary orientation with the emphasis on developing innovation, entrepreneurial attitude, commitment to the development of the region and high sense of achievement. Another thrust of training will have to be directed to the whole administrative set-up, which would be interacting with the FSS staff as well as the farmer. The orientation of this programme would be towards developing those skills which would facilitate transfer of technology, increase in risk bearing capacity, interpersonal competence and skills.

7 MOBILISATION OF INSTITUTIONAL FINANCIAL RESOURCES

55.7.1 In estimating the broad magnitude of credit requirements in the agricultural sector due cognisance has to be taken of the production and investment requirements of all types of farmers—small and marginal farmers as also medium and large farmers. Credit cannot, however, be distributed over the different socio-economic classes in the rural economy on a *pro-rata* basis according to land. It has necessarily to be related to the intensive investment needs for optimum utilisation of the meagre land resources of the rural poor. If due to overall national constraints and policy governing expansion of credit, it becomes necessary to ration institutional finance for agriculture, due weightage will have to be given to the small and marginal farmers, agricultural labourers and rural artisans, in respect of interest rates and period of repayment as well as quantum of assistance. These sections constitute the

majority of the rural households and have a claim on the national resources for enabling them to rise above the poverty line. The overall pattern of sectoral and regional distribution of credit must be gradually brought in line with the output and mobilisation of resources by way of deposits.

55.7.2 These general principles have been kept in view in estimating the overall credit requirements in this Chapter. The requirements of credit for crop production differ for irrigated and rainfed agriculture. In keeping with the principles enunciated above, it is also necessary to work out separately the requirements for small and marginal farmers and others. For this purpose, the net irrigated area and unirrigated area has been apportioned between the size holdings (a) upto 2 ha and (b) above 2 ha in the same proportions as were prevailing in 1971. According to agricultural census (1970-71) data, these two categories of holdings accounted for the following percentage shares in the net irrigated and unirrigated areas:—

Percentage Share in Net Irrigated and Unirrigated Areas—1971

Size of holding	Net irrigated area	Unirrigated area
upto 2 ha	31.0	19.6
above 2 ha	69.0	80.4
all holdings	100.0	100.0

Applying these percentages, the distribution of the total net area sown will be as under:

Size of holding	(million hectares)		
	Net Area Sown		
	irrigated	unirrigated	Total
upto 2 ha	15	19	34
above 2 ha	32	79	111
all holdings	47	98	145

A comparison of the distribution of operational area by sizes of holdings in 1971 and 1985 is given in Statement I of Appendix 55.9. 1 Agri.—5.

55.7.3 The proportions of the irrigated and unirrigated areas in 1985 among small and marginal farmers and medium and large farmers may, however, turn out to be different from those obtaining in 1971. It has not been possible to take a view regarding these proportions in view of the present state of flux in regard to land holding patterns. To the extent the actual proportions differ from those assumed, the estimates of credit requirements may have to be revised.

55.7.4 The magnitude of credit requirements for crop production programmes by 1985 has been estimated separately for the two types of areas: viz., (a) presently irrigated or newly irrigated areas; and (b) unirrigated areas. In regard to short-term loans it has been assumed that credit would be required at the rate of Rs. 600 per hectare in the first category of areas and Rs. 450 per hectare in the second category. As regards medium and long-term loans the yardsticks of credit requirements per hectare used are as below:—

	(Rs. per ha)
for preparation of land covered under major and medium irrigation (8 Mha)	1,350
for improvement in 5 Mha already developed under major and medium irrigation	200
for improvements in area covered by minor irrigation (1 Mha)	200
groundwater development (9 Mha)	1,000
land development in unirrigated areas : levelling, soil conservation, water harvesting, ponds etc.	500

Estimates in regard to the extent of area coverage under the above type of works are given in Appendix 55.9—Statement II. Bullocks will continue to be the main source of draught power for cultivation. It is, therefore, necessary to ensure that adequate credit is available to farmers for purchase of bullocks. Under the present cooperative law it is not necessary to mortgage land as security for loans upto Rs. 2,000 and as such the farmers can freely avail of credit from cooperative societies for purchase of bullocks. Further, there is a provision that 25 per cent of short-term credit can be availed on medium-term basis, *inter alia*, for purchase of bullocks. These provisions should be availed of for extending necessary credit support for purchase of bullocks. No specific earmarking of funds however seems to be necessary for this purpose.

55.7.5 It is estimated on a rough basis that the requirements of medium and long-term loans for machinery and implements would be of the order of Rs. 400 crores by 1985. These would be shared by the State agro-industries corporations, farmers' service societies or other cooperative/custom service units and individual farmers equally. If marginal and small farmers are helped by agro-industries corporations and co-operatives, the individual loans could be for bigger farmers who could be asked to contribute 25 per cent margin money.

55.7.6 Requirements of credit for various programmes of livestock development namely, milk production, poultry, sheep and pig production as also fisheries development have been estimated on the following basis:

- (i) Milk Production—It is anticipated that by 1985 in about 150 districts identified as having potential for milk production and marketing, 5.70 million small and marginal farmers and agricultural labourers (at the rate of 38 thousand farmers per district) would require medium-term credit at the rate of Rs. 500 per farmer. Further, about 2,000 farmers per district belonging to other sections of the farming community would also look for credit for undertaking milk production programmes. Their medium-term requirements have been put at Rs. 2,000 per farmer.
- (ii) Poultry, Sheep and Pig Production—The programmes¹ envisaged in regard to the establishment of pig production, poultry and sheep development units through small and marginal farmers and agricultural labourers in selected districts and the per unit requirement of credit is as follows:—

	Number of units (lakhs)	Per unit requirement of credit	
		short-term	long & medium-term
		Rs.	Rs.
piggery . . .	2.0	5,900	1,530
poultry . . .	5.0	1,560	1,800
sheep . . .	4.2	480	2,160

¹ 1973. Poultry, Sheep & Pig Production through Small & Marginal Farmer and Agricultural Labourers for supplementing their income. Interim Report National Commission on Agriculture, Government of India, New Delhi.

With regard to other sections of the farming community who would also require credit for the establishment of poultry, sheep and pig production units, the estimates have been worked out on the following basis:—

	Number of units (lakhs)	Per unit requirement of credit	
		short-term	long & medium-term
		Rs.	Rs.
piggery	1.0	11,800	3,060
poultry	2.5	3,120	3,600
sheep	2.1	960	4,320

- (iii) Fishery Development—It is envisaged that by 1985 small fishermen will require short-term loans at the rate of Rs. 2,220 per hectare and the total coverage under this programme would be one million hectares. Further, medium and long-term loans will be required for repair of existing ponds covering a total area of 0.54 million hectares (at the rate of Rs. 7,500 per hectare). Medium and long-term credit will also be required for reclamation of fresh and brackish water swamps. The coverage under each type of programme namely, fresh water swamps and brackish water swamps is envisaged at 36 thousand hectares. Credit will be required at the rate of Rs. 12,500 per hectare.

Appendix 55.9—Statement III presents the scale of credit requirements assumed for various livestock and fisheries development programmes.

55.7.7 As regards forestry development it is estimated that the institutional finance of the order of Rs. 450 crores (Rs. 110 crores in 1980 rising by another Rs. 340 crores during the period 1980—85) will be required in addition to the investment requirements met out of plan funds. Since this requirement has to be negotiated with the ARC it has not been included in the present estimates of credit requirements which have to be derived from the cooperative system and the commercial banks.

55.7.8 The requirements of credit for meeting the full requirements of crop production have been worked out in Appendix 55.9—Statement IV. The following table sums up these estimates:—

TABLE 55.4

Credits Requirements by 1985 for Full¹ Coverage

	(Rupees crores)		
	Marginal and small farmers	Medium and large farmers	Total
short-term loans	2,193	5,691	7,884
medium & long term loans .	2,497	5,768	8,265
Total	4,690	11,459	16,149
provision for machinery and implements			400
			16,549

The above estimates of credit requirements are in respect of programmes of development both in irrigated and unirrigated areas including investment in land improvement and irrigation as also allied programmes relating to livestock and fisheries development.

55.7.9 The estimates of 'full' requirements have to be translated into a realistic financial programme to be met by the cooperative and commercial banks. This has to be done on the basis of following factors:—

- (i) provision has to be built in for ploughing back of surpluses particularly in the higher land holding and earning strata to operationalise the concept of graduation;
- (ii) limitation of financial, personnel and organisational resources have to be kept in view, particularly as the question is one of providing a package of integrated services including funds and of organising the weaker sections to use the services effectively;
- (iii) it would be unrealistic to expect a hundred per cent response from all the prospective users of credit; and
- (iv) within the framework of 'full' requirements, priorities have to be given either on technical considerations

¹These requirements correspond to the programme target set out in Appendix 55.9—Statement II.

(such as quick development and use of full irrigation potential) or national aspirations regarding social justice in development.

For the purpose of working out realistic estimates of credit requirements in 1985 to be met from institutional sources, the following graduation has been affected in case of crop production programmes:—

TABLE 55.5
Basis of Graduation of Full Requirements

		(per cent)	
		Marginal and small farmers	Medium and large farmers
areas already or to be irrigated:			
(i) short-term loans:			
coverage by 1985		100	100
scale of financing		100	50
(ii) long & medium term loans :			
coverage by 1985		100	100
scale of financing		100	100
unirrigated areas:			
(i) short-term loans :			
coverage by 1985		50	50
scale of financing		100	60
(ii) medium and long term loans :			
coverage by 1985		50	50
scale of financing		100	60

In respect of the livestock and fisheries development programmes no graduation is considered necessary since the programme coverage envisaged is considered to be the minimum. The graduated requirements have been worked out in Appendix 55.9 (Statement V)—on the above basis. Due deduction has also been made for subsidy element to which the small and marginal farmers and agricultural

labourers are eligible under SFDA and MFAL programmes. The graduated requirements work out to Rs. 9,400 crores as follows:—

TABLE 55.6

Graduated Requirements of Credits for 1985

	(Rs. crores)		
	Short term	Medium and long term	Total
marginal and small farmers	1766	2022	3788
medium and large farmers	2242	3003	5245
	4008	5025	9033 + 400*
or say	4000	5000	9400

55.7.10 We are of the view that 45 per cent of the 1985 level of graduated requirement of short-term loans and 40 per cent medium and long-term loans should be met by the end of the Fifth Five Year Plan itself. Allocation of this responsibility between the commercial and cooperative banks has been worked out in Appendix 55.9—Statement VI. It would be observed that by 1979, i.e., the end of the Fifth Plan, institutional financing of agriculture is projected to rise to Rs. 3,550 crores from Rs. 1,537 crores by the end of 1973-74. Of this, the share of commercial banks would be 41 per cent. Their advances to agriculture will rise to 10 per cent of their total advances as compared with 8.8 per cent as in June, 1974. The increase in total lending through the cooperative system would be from Rs. 919 crores in 1973-74 to Rs. 2,100 crores at the end of the Fifth Plan. A steeper rise is visualised in commercial bank credit for agriculture during the period 1979—85. The agricultural loans advanced by the banking system are expected to go up from Rs. 1,450 crores in 1978-79 to Rs. 4,050 crores in 1984-85. At that stage they will meet about 49 per cent of the total requirements of credit by the agricultural sector and their agricultural advances will constitute about 15 per cent of their total advances. The cooperatives will have to work for almost a doubling of both short-term credit and medium and long-term credit during the period 1979-85. A recent estimate formulated by the National Institute of Bank Management puts the

For Agricultural machinery and implements.

likely bank deposits in March 1979 at Rs. 23,000 crores and by March 1985 in the range of Rs. 42,000 and 46,000 crores. In case these estimates are actually realised it would be possible to increase the magnitude of credit availability to the agricultural sector. In such an eventuality it might be possible to meet the credit requirements of the agricultural sector in general and the small and marginal farmers in particular to a greater extent than visualised here.

55.7.11 The above estimated credit requirements for 1985 as per the graduated scale are modest in the context of urgent national needs. Even then they imply the growth of agricultural financing by commercial banks and cooperative banks in multiples of the levels obtaining in 1973-74. We recommend that the Reserve Bank of India and the Government of India should immediately initiate planning for business and manpower development in the commercial banking and cooperative systems to equip them to fulfil these expectations. It is also obvious that the institutional financing agencies would be able to achieve these goals only through expanding dealings with farmers' organisations primarily the farmers' service societies, regarding which an appropriate programme of work has already been suggested earlier in this Chapter.

8 MEASURES FOR IMPLEMENTATION OF NATIONAL POLICY

55.8.1 The credit policy can be effective and deliver the goods in the context of an overall agricultural policy offering the conditions and incentives to the farmers for productive use of credit and realising the due benefit for his risk taking and extra effort. The overall policy will also take care of undue concentration or command over productive resources, which have caused problems of rural tensions so far. The main elements of the agricultural policy have been indicated in Chapter 7 on 'Policy and Strategy'.

Marketing and Storage

55.8.2 Serious attention needs to be given to the development of storage and marketing systems to keep pace with expansion of output generated by credit service, adoption of high yielding varieties and enthusiasm and entrepreneurship of the progressive Indian farmers. Storage development should start right on the farm, with suitable plastic or lockable steel bins or farm housing with built-in storage as a part of the equipment offered by the FSS.

55.8.3 The quickest way of developing adequate storage capacity would be to encourage the FSS and cooperative sector to build it, with guaranteed reservations of space for Government/FCI requirements. The FSS construction would have to meet the correct specification. This may obviate difficulties of wrong locations, high charges and delays in construction. They would be financed through normal commercial credit channels and supported by government only to the extent of guaranteed space reservations. They will be under government control so far as storage standards, grading and issue of warehouse receipts are concerned. The next link in the chain would be improvement in negotiability of warehouse receipts to the extent feasible without contravening the spirit of selective credit controls. Both the systems need to be strengthened and extended rapidly.

55.8.4 With judicious use of FSS, the Food Corporation of India (FCI) can play a very big role in the marketing network. In surplus districts, the FSS can operate as the FCI's agent for purchase agreements at declared prices, the credit application made by the FSS member itself could have an undertaking to sell.

Immediate Action by Commercial and Cooperative Banks

55.8.5 We also recommend that location of new branches of commercial banks in rural areas should be related to concentration of small farmers, to ensure reasonable proximity and mutual access. Further, the commercial and cooperative banks should give priority to covering the credit needs of a large number of presently 'non-borrowing' members, blending credit with services. Existing societies need to be strengthened and expanded, with special attention to non-borrowing members and grafting on of input supply functions. This in many cases may pave the way for the new FSS. In other places, FSS's may need to be organised *de novo* to break the stalemate.

55.8.6 Simultaneously, as already proposed earlier, reduction of loans for cash crops may enforce on a graduated basis, to stimulate ploughing back of surpluses as working capital. Alternatively, for medium and big farmers, loans for agriculture should be linked with average saving or fixed deposits to be maintained by the parties, with the banks, this should be done both by commercial and cooperative banks.

55.8.7 It is felt that institutional financing agencies should not accept past debts of private money lenders as such debts may represent several questionable and illegal practices. Such debts should be scaled down in the light of prevailing regulations regarding debt

redemption. Whatever amounts are outstanding should be taken care of in normal cases by the period of repayment being extended and the production programmes of the farmer so broad based as to take care of the repayment of not only the instalments of the old loans, but also the due instalment of the new loans. Whilst the FSS may not take the responsibility of recovering the old loans, it can help in observing a discipline so that genuine cases are disposed off fairly by a convention.

Re-modelling and Expansion of Bank's set-up

55.8.8 We would strongly urge that the major public sector banks should keep a horizon of the next 10 to 15 years in view and start re-modelling their set-up and composition of personnel for agricultural financing as a part of rural development planning and operations, so as to be able to service 25 to 50 new FSSs per year initially and 75 to 125 per year from the fourth year onwards. At the head office/regional office, it would be necessary to build up two cells. One would be concerned with techno-economic and financial expertise for guiding new FSSs in their business with a project approach. Some specialisation by geographical area, commodities and production activities would become essential for guidelines regarding financial discipline both to general FSSs and functional cooperatives. On the other hand, another nucleus will be necessary for review, supervision and control to ensure that business expands on the right lines. At the Branch level, a cadre of people will have to be developed who have a scientific and practical grasp on agricultural business to be able to help the FSSs to operate and expand with discipline and thoughtful dynamism and also to provide continuous feedback on local peculiarities and needs.

Small Savings and Agricultural Development

55.8.9 The concept of linking specific investments for local agricultural development with locally mobilised savings should be adopted. Depending on the normal level of net increase in small savings, accepted in the district, it should be possible to have specific schemes of a local nature ready for implementation. Such schemes may be in the area of minor irrigation, custom service, well equipped stationary or mobile veterinary services units or godowns and cold storage plants. We would, however reiterate two conditions for the implementation of this idea, viz., (a) the investments must represent collective benefit to a substantial number of rural producers

and provide a missing link in the chain of facilities being planned for them and (b) such activities must not result in compensating reduction in the State outlay for agricultural development.

9 OTHER INCENTIVES INCLUDING SUBSIDIES

55.9.1 Apart from credit, there are other incentives which are necessary for increasing agricultural production. The farmers have, during recent years, demonstrated that despite their conservatism they are capable of making adjustments in their attitude and approach to improved practices designed to increase the returns from their small holdings. Thus, for a breakthrough in agricultural production, it is necessary for the Government not only to increase the availability of physical resources needed but also to adopt such measures as would provide adequate incentives to the farmers to accept and adopt modern scientific methods of cultivation and remove the existing disincentives to increase production.

55.9.2 The incentives for agricultural development can be broadly classified into two types, namely those which directly influence the returns from farm business such as price support and price guarantee, and non-price incentives which either reduce the cost of production or stimulate investment by farmers. Price incentive has been dealt with in detail in our Interim Report on Price Policy for Agricultural Commodities and has been briefly dealt with in the Chapter 7 on Policy and Strategy. The subject of Cattle Insurance has been discussed in Chapter 28 on Cattle & Buffaloes. Other incentives, which are essentially in the nature of measures for inducing the farmers towards adoption of improved practices and techniques and bringing about structural and technological changes in the system of production, are discussed here. Broadly, they include the following items:—

Subsidies and rebates

- (i) subsidies in the form of financial assistance for development programmes and supply of production requires at reduced rates
- (ii) rebates and concessions in taxes and levies for encouraging agricultural development or inducing changes in cropping patterns
- (iii) concessional rate of interest and relaxation regarding the period of repayment

infra-structure services and institutional changes

- (i) provision of infra-structure facilities like processing and marketing and storage etc.
- (ii) crop-insurance to indemnify losses due to natural phenomena like drought, floods, etc. and other factors like pests, plant diseases etc.
- (iii) institutional changes
social incentives in the form of rewards, social recognition of outstanding farmers etc.

Subsidies

55.9.3 The use of subsidies for agricultural development has been in vogue in India for the last three decades. Under the Grow More Food (GMF) Campaign initiated in 1942-43 the State Governments gave subsidies to farmers in respect of private minor irrigation schemes, land improvement schemes and schemes for improved seeds and manures. The Central Government shared the cost of subsidy on account of these items as well as the non-remunerative portions of public minor irrigation works to the extent of 50 per cent (66-2/3 per cent in the case of Assam and Orissa) of the expenditure. The partition of the country in 1947 aggravated the shortages of food-grains as well as of some commercial crops such as cotton and jute. Consequently, the GMF campaign was suitably modified and an Integrated Production Plan was formulated both for food-grains and commercial crops. With the initiation of the First Five Year Plan, the integrated programme formed part of that Plan. In the First Five Year Plan, subsidies were continued, but the pattern of subsidies underwent certain changes. Based on the experience gained on the working of the pattern of subsidies in the First Plan period the scope of subsidies was enlarged in the Second Plan and the Central assistance to States on account of subsidies was liberalised to cover additional items. In the case of some schemes as poultry development a tapering subsidy of 50 per cent in the first year, 33-1/3 per cent in the second year and 25 per cent in the third year was given on recurring expenditure. The Central assistance ceased in the fourth year.

55.9.4 A definite departure regarding the approach to the grant of subsidies was made during the Third Plan. The policy on subsidies was enunciated as follows:—

“The general policy should be to reduce these subsidies progressively and where possible, to eliminate them. There

might be some justification for a subsidy which is intended to benefit the poorer sections of the community or to support for a limited period innovations or improved practices which have not yet been accepted. The existing schemes of subsidies should be reviewed critically and, after examining other ways of achieving the same objects, phased programmes should be drawn up for reducing and, to the extent feasible, terminating the subsidies."¹

55.9.5 While formulating the Fourth Five Year Plan, the policy regarding subsidies for agricultural development programmes and agricultural inputs enunciated in the Third Plan was endorsed. As a matter of policy, therefore, subsidies were allowed during the Fourth Plan period only on a selective basis and not for agricultural development programmes in general. However, some subsidies were given in exceptional cases such as for the distribution of inputs like fertilisers and pesticides in backward and inaccessible areas. In the case of the integrated dryland agricultural development project a subsidy of 50 per cent was given to all the participating farmers for inputs including fertilisers and pesticides during the first year and 25 per cent during the second year. Subsidies were also provided for selected items for promoting the production of export-oriented crops.

55.9.6 Subsidies were also provided under certain special programmes such as Small Farmers Development Agency, Marginal Farmers and Agricultural Labourers Development Agency and the Integrated Dry Land Agricultural Development Scheme. The participating small farmers were given a subsidy up to 25 per cent of the capital investment on construction of wells, purchase of agricultural equipment and livestock, etc. The participating marginal farmers and agricultural labourers were given a subsidy up to 33.3 per cent for similar purposes. Under the Drought Prone Areas Programme (DPAP) subsidies are designed to facilitate the propagation of new technology, the participation by small farmers and the flow of credit for weaker groups and new activities.

55.9.7 The cooperative sector so long reluctant to invest large sums of money to support the small and marginal farmers even for proven creditworthy schemes, was assigned a special role in the SFDA-MFAL scheme. In order to induce the cooperatives to support the production programmes of the small and marginal farmers and agricultural labourers, a special subsidy of 6 per cent was given to the primary societies on the additional loans advanced by them to

¹Third Plan, pp. 309-10 (paragraph 17).

these people and a 3 per cent risk fund subsidy to the cooperative banks on the amounts thus advanced in the SFDA areas. In the MFAL areas, the corresponding rates of these subsidies were 8 per cent and 3 per cent respectively. For long-term loans, the land development banks were given a 3 per cent risk fund subsidy on additional loans advanced to small and marginal farmers. Since July 1, 1974 the two schemes (SFDA and MFAL) have been amalgamated to constitute a unified programme.

55.9.8 The integrated Dry Land Agricultural Development Scheme was initiated in 1970-71. Under this scheme a subsidy of 50 per cent was given to all participating farmers for inputs like seeds, fertilisers, pesticides, etc. during the first year and 25 per cent in the second year. For permanent works such as soil conservation and land development, subsidy was given at the rate of 25 per cent of the capital cost. For institutional programmes of development such as demonstrations, farmers' training, purchase of machinery and equipment, full cost was met by the Government. In endemic areas, where repeated aerial spraying was necessary for eradicating pests and diseases, the expenses on hiring of planes was borne by the Centre and the cost of the material used by the State Government concerned. In addition to the cases cited above, provision for subsidies was made for consolidation of holdings on a promotional basis which was shared by the Centre.

Review of the Working of Subsidies

55.9.9 Based on the experiences of the working of the subsidies as briefly related above, the basic principles of selective application of subsidies could be reiterated. Subsidies are no doubt among the most important non-price incentives for inducing the individual cultivators to adopt certain improved agricultural practices and make increased investment in farming. Subsidy implies a limited amount of assistance which has to be supplemented by the beneficiary. Grant of subsidies renders the price of new inputs or the cost of new development activity to beneficiary individuals/institutions more attractive, thereby overcoming resistance or hesitation for the new inputs/programmes on account of the risk and uncertainty associated with these programmes in the minds of the farmers. Subsidy generally placed the price of new inputs or the cost of new development activity within reach of farmers of small means and thus helps to remove the limitation imposed by their low investment capacity. Thus, the beneficiaries are induced to undertake medium and long-term investment needed for achieving larger production. In other words, subsidies are designed either to compensate for the high cost or, are in

the nature of a promotional measure. Grant of subsidy could take the form of sale of inputs and services at concessional prices, free supply in kind or grant of cash in some cases.

55.9.10 As enunciated in the Third Five Year Plan and endorsed in the Fourth Plan, no subsidies should be given for agricultural development programmes, including distribution of inputs, except to the weaker sections of society such as the small and marginal farmers and agricultural labourers whose present incomes are below their minimum levels of need and who are, therefore, not in a position to adopt modern technology. This class has not so far benefited much from the massive investment made by the State in agricultural development.

55.9.11 The major drawbacks in the scheme of subsidies have been the malpractices in the selection of beneficiaries, administrative delays in the release of subsidies, diversion of inputs subsidised for specific agricultural purposes to other competitive uses and lack of proper technical support and guidance to the beneficiaries from the extension agency. There has generally been a lack of publicity also of the various programmes entailing the grant of subsidy, with the result that the majority of the small farmers and agricultural labourers had very little or no knowledge of these programmes. Further, the procedure laid down for the grant of subsidy is cumbersome and not easy for an average illiterate and ill-informed villager to follow. Also there has been no attempt to evolve an integrated pattern of subsidies, taking into account the relative costs and benefits of other inputs and services, in the package. The result is that a judicious and balanced use of different inputs and practices cannot be promoted.

55.9.12 The grant of subsidies has been provided for modernising agriculture in backward and inaccessible areas. The benefit of subsidies in such areas has, however, been only marginal so far, mainly because of the underdeveloped state of the basic infrastructure in these areas. Lack of irrigation, transport and marketing facilities, inadequate supply points for the distribution of material inputs, and a weak or virtually non-existent cooperative organisation have been the main hurdles. Creation of an effective infrastructure for economic growth is essential for these areas. In this connection, transport subsidy holds special importance in the conditions of difficult terrain, long lines of communication and costly transport. In order to mitigate these disadvantages, subsidy on transport charges is fully justified, wherever deemed necessary.

55.9.13 In brief, the policy for subsidies should be based upon the principles of selective application and subvention for those classes,

sectors and programmes that need support in the interest of balanced development and in keeping with the objective of growth with social justice. The essential elements of this policy framework are: subsidies for (a) small and marginal farmers (25 and 33-1/3 per cent respectively), (b) transport in difficult and hilly areas and (c) new schemes and pilot projects designed to promoting the adoption of a particular improved practice or technique. In the last case, subsidies, if any, should be provided on a diminishing scale for a limited period and should be strictly selective. To illustrate, subsidies have been provided under development programmes of pilot or innovational nature or special programmes of regional or national importance, such as the National Demonstrations Programme, Integrated Dryland Agricultural Development Programme, etc. These programmes have also generally a long gestation period. The grant of subsidies under such programmes is justified on the ground of their experimental, educational or pioneering value and should not be judged merely or strictly on the principles of cost-benefit ratio. However, as brought out in Chapter 54 on Extension intrinsic motivational methods rather than the extrinsic ones *i.e.*, subsidies etc. should be used more and more to motivate the farmers.

55.9.14 It might be added further that where the cost is unduly high subsidy might be provided with the object of providing the facility to the average farmer at reasonable rates. Improved seeds or seedlings in the case of selected crops, plant protection and aerial spraying are the illustrative cases. Even when the cost is reasonable, as explained earlier in this chapter, promotional subsidy could be provided for introducing and popularising a new practice or programme.

55.9.15 As mentioned earlier, export-oriented crops occupy a special position in the scheme of subsidies on account of their national importance from the point of view of foreign-exchange earning or import substitution. To give some examples, provision for subsidies has been made towards the cost of plant protection equipment, and inputs required for demonstrations under cotton development schemes. Similarly, for the development of tobacco, provision of subsidy has been made towards the construction of barns and production of seedlings. There is also provision of payment of subsidy on certified improved jute seed and seed production and plant protection measures under oilseeds development programmes, etc. These subsidies should be reviewed periodically and should be discontinued as soon as the purpose has been served and are no longer justified.

55.9.16 Besides, there are a number of other areas where in the element of subsidy is involved though in a covert manner. All loans

through cooperative societies and other institutional agencies contain a concealed subsidy in the form of a comparatively low rate of interest. Farmers should be encouraged to save on a recurring basis in the form of deposits with the banks and other institutions. They should be provided credit on liberal terms in times of crop failure. There is adequate scope in these cases for adjusting the period of repayment to suit the needs of weaker sections. Pool price of fertilisers may similarly contain an element of subsidy. Similarly, all major irrigation works in a way involve an element of subsidy in the shape of low irrigation rates. There is hardly any case where irrigation/water rates cover interest and provision for amortisation. In a large number of cases, the amounts collected are not adequate to meet even the cost of maintenance.

55.9.17 In different chapters of this Report we have made some recommendations regarding the subsidies, specially for the weaker sections of the farming communities, which in our opinion are justified. For example, subsidy on (a) transportation charges of pesticides from rail heads to distribution points for stabilising prices, (b) aerial spray, (c) appliances, and (d) spraying pesticides in epidemic areas has been recommended. Further railway concessions on transport of animals to inaccessible grazing areas, subsidies for expanding fishing efforts in the exploitation of off-shore fisheries and plantation subsidies to individual coconut growers, should also continue. The other subsidies recommended by us for weaker sections are given below:—

- (i) Subsidy on the cost of pesticides should be continued only in the case of small and marginal farmers.
- (ii) The small and marginal farmers should be exempted from the payment of cost of consolidation of their land.
- (iii) For reclamation of alkaline lands, gypsum may be supplied to the small and marginal farmers at subsidised rates.
- (iv) Both on the grounds of equity and fuller utilisation of resources, it would be just and fair to give small farmers first priority for all concessional agricultural credit facilities and even subsidies on a temporary basis.
- (v) In order to provide an adequate incentive for effective mobilisation of agricultural labour and other weaker sections for construction/improvements of their houses including sheds for subsidiary occupations, bricks may be made available free of cost.
- (vi) Prophylactic vaccinations should be charged on a no-profit and no-loss basis from the beginning of 1985. However,

the services rendered and the biologicals used under the national programmes of disease control and in the event of natural calamities should continue to be free.

55.9.18 Some of our major recommendations pertaining to subsidy contained in the Interim Reports for the weaker sections are enumerated below:—

- (i) A subsidy of 25 per cent to small farmers and 33-1/3 per cent to marginal farmers towards capital investment on construction of wells/tubewells, purchase of equipment, etc. should continue to be available.
- (ii) Input subsidies at present being allowed to marginal farmers in MFAL areas upto 33-1/3 per cent subject to a ceiling of Rs. 100 per participant for two cropping seasons should be allowed for one cropping season only.
- (iii) Subsidies for new/extension plantings of tea on small tea plantations (upto 5 hectares) should be extended to make them economically viable.
- (iv) There should also be special rates of subsidies in the case of small tea growers for replantation/replacement of tea to compensate them for the investment involved as well as to provide a reasonable margin for loss of normal production during the period of replanting.
- (v) To encourage widespread use of inputs for production of foodgrains, subsidy on inputs should be given in the case of small and marginal farmers.
- (vi) Subsidies should be provided for programmes of land development for small and marginal farmers.
- (vii) Financial assistance should be extended to the small/marginal farmers for rearing cross-bred heifers in the form of 50 per cent subsidy and 50 per cent loan. Agricultural labourers should be given two-third subsidy and one-third loan for the purchase of concentrates for heifer calves upto the calving stage.
- (viii) Subsidy of 25 per cent and 33-1/3 per cent for small and marginal farmers respectively should be given for purchase of birds and equipment and for construction of poultry houses to start units of 50 layers. Loan and subsidy may also be allowed on the cost of feeding young chicks upto the laying stage as also for the production of second batch of birds upto the laying stage.
- (ix) The feed supply to the small and marginal farmers or agricultural labourers should be adequately subsidised to help

them to maintain a suitable feed cost/egg price ratio whenever there is an abnormally high rise in the cost of the feed without corresponding rise in the price of eggs.

- (x) Small and marginal farmers may be given 25 per cent subsidy by the Centre for digging open wells for mulberry plantations in Karnataka under the sericulture development programme to be financed by the Central Silk Board.
- (xi) Free house sites should be given to the landless labour families for house construction.

55.9.19 We have also recommended in our various Interim Reports the following subsidies:—

- (i) The cooperatives and banking institutions supporting the production programmes of small/marginal farmers and agricultural labourers, through advances, should be subsidised at lower than the existing rates. The reduced rates recommended are as follows:

Rates of Risk Fund Subsidy

	(per cent)	
	Existing	Recommended
long-term loan		
land mortgage banks	3	2
medium-term loan		
primary societies	6*	4
central cooperative banks	3	2
short-term loan		
primary societies	6	4
central cooperative banks	3	2

- (ii) Subsidy for transportation of inputs in the SFDA and MFAL schemes should be continued.
- (iii) Subsidy to cooperatives for the development of markets and storage construction in SFDA and MFAL areas should be continued.
- (iv) Preferential rates of subsidy should be extended for undertaking measures of land development for tea plantations

*8 per cent in MFAL areas

- in certain problem areas, *e.g.* Darjeeling and some plantations in South India.
- (v) To induce pepper growers to take up plant protection measures, plant protection chemicals and equipment should be supplied at 25 per cent subsidy.
 - (vi) In difficult areas, it may be necessary to subsidise transport cost to bring down the price of delivered inputs.
 - (vii) For promotional efforts, where a new crop or a practice is to be introduced, input subsidy may be provided to growers to enable them to take new risks but subsidy is to be withdrawn after it has served its purpose.
 - (viii) In case of failure of a private well or a tubewell in difficult areas, where groundwater is scarce the cost incurred thereon should be subsidised by the State.
 - (ix) Cooperative societies of poultry farmers, sheep breeders and pig breeders in SFDA and MFAL areas should be provided with credit and subsidy towards the cost of fixed and working capital.
 - (x) Under the whole village development programme for trial in the pilot projects, subsidies should be given to the common fund instead of individual beneficiaries to cover the risk, on the same rates as applicable in SFDA and MFAL areas.

55.9.20 We feel that besides extending subsidies to the weaker sections of farmers for enabling them to undertake development programmes to augment productivity levels, it would be necessary to extend other forms of technical and financial assistance in order to popularise some other development measures. Where such assistance is considered necessary, the form of assistance desired has been recommended in the relevant chapters. Illustrative instances of such recommendations are given below:—

- (i) Rural compost programmes offer a gigantic potentiality of organic manures and plant nutrients. However, such programmes have, of necessity, to be widely dispersed. In order to involve local agencies and make them responsible for these programmes necessary technical assistance and financial incentives would have to be extended to these agencies.
- (ii) Introduction of gobar gas plants on a large scale, for meeting the energy requirements of rural households, while retaining the manurial value of the dung, is very essential. This programme would have to be supported with ade-

quate technical assistance and help.

- (iii) Contour bunding and other soil conservation measures on cultivators' lands in catchment areas lead to greater productivity. Since such capital investment is economic, suitable areas should be identified and institutional programme of credit developed to facilitate soil conservation measures by individual farmers. There may be marginal cases where capital subsidy would be required to ensure viability. Where necessary and justifiable such subsidy may be extended.

Rebates and Tax Concessions

55.9.21 Rebates and concession in taxes on agriculture are the fiscal weapons through which incentives could be provided. Direct taxes on agriculture consist of land revenue cesses and surcharges on land revenue, cesses on crops, and agricultural income-tax. Among other rebates and concessions are the development rebates allowed to all agro-input industries by treating them as priority industries. This was allowed for new machinery or plant installed for the industries listed in the Fifth Schedule to the Income Tax Act, 1961, which included tractors, earth moving machinery and agricultural implements, fertilizers, pesticides, cottonseed and other vegetable oil and oilcakes, tea, processed seeds, processed concentrates and processed fish and fish products.

55.9.22 The Finance Act, 1968 introduced a new tax incentive for improving agricultural productivity and increasing supplementary food resources to companies which use the products of agriculture, animal husbandry or dairy or poultry farming as raw material for their manufacturing and processing activities. This incentive takes the form of a weighted deduction from income, equal to one and one-fifth times the amount of expenditure on such items.

55.9.23 Expenditure incurred on scientific research in the fields of agriculture, animal husbandry and fisheries is admissible in full as deduction in computing taxable business profits. Capital expenditure on scientific research is allowed in full as a deduction in the year in which such expenditure is incurred. In addition, new machinery or plant installed for the purpose of scientific research is entitled to development rebate.

55.9.24 Development rebates granted to agro-input industries have given them a fillip. Plants and machinery installed for the manufacture of tractors, agricultural implements, fertilisers, pesticides,

etc. have strengthened the infrastructure for agriculture. The rebates allowed for the installation of such plants and machinery is justified and should continue. Tax concessions given in respect of expenditure on scientific research are also valid and should continue.

55.9.25 The irrigation rates are generally low and as recommended in Chapter 15 on Irrigation there is need for upward revision of water rates to cover the loss. The overall consideration is that taken as a whole, the irrigation works in a State should not impose any burden on the general revenues. However, on canal systems where farmers are prone to speculate on rainfall in order to avoid having to pay for irrigation, a two part tariff has been recommended. On new irrigation system, gradually rising concessional rates in the initial two or three years might be levied as a promotional measure.

Crop Insurance

55.9.26 Agriculture is subject to uncertainty due to its dependence on rainfall in a large measure. Farming is carried on in the face of risks arising from the vagaries of weather and incidence of pests and plant diseases. Losses may occur due to drought, flood, cyclone, snowfall, hailstorms and in some cases even fire. There may be severe crop failures also. Thus, farmers have to face the risk of uncertainty of crop yields which is larger in rainfed areas. Due to insufficient resources with them, the farmers are unable to stand such risks, especially when these involve disastrous losses. In years of natural calamities, agricultural production registers a sharp decline resulting in fall in farm incomes depriving the farmers of their sustenance and capacity to invest in next year's operations. In such a situation the farmers may not be in a position to pay their rents, taxes and loan instalments. This element of risk acts as a disincentive to the adoption of new and scientific methods of farming for improving crop yields as these involve larger investments. The best means of transferring the risks, particularly those arising from natural factors is insurance. A view has been expressed that provision of assured irrigation in all potential areas is a better alternative to crop insurance as it is cheaper. This view is, however, not wholly correct because a large number of risks mentioned above could be equally applicable to irrigated areas. In fact, the high yielding varieties in these areas are more prone to pests and diseases. Also irrigation can be provided only to a limited area.

55.9.27 Crop insurance is a device to meet the problem of risks in farming. It gives the farmer some protection against the uncer-

tainties of crop yields in return for the payment of stipulated small sums as premia. It helps in stabilising farm incomes and is complementary to the measures being taken by the Government for strengthening the base of agriculture like development of irrigation, drainage, soil conservation, etc. A contractual right to compensation in the event of crop failure strengthens and protects the farmers' credit in general and by using the insurance policy as a collateral security for loans in particular. Government's obligation to provide relief in case of failure of crops due to natural calamities is also reduced to the extent farmers themselves pay through insurance.

55.9.28 In view of the benefits of crop insurance, a number of countries have introduced it in various forms. Many national Governments spend annually large sums to meet a part of the administrative expenses and also a portion of the premia. However, lack of basic data on crop losses necessary for working out the actuarial basis, the preponderance of small and scattered farms lack of adequate understanding of the value of crop insurance, limited ability of farmers and financial resources and lack of trained personnel are the problems faced by a developing economy in the adoption of crop insurance. In India the need for introducing crop insurance against drought, floods, pests and diseases and for providing a minimum security to the farmers at the production stage has been recognised. Though the question has been under consideration for a long time, the scheme of insurance has not gone beyond the stage of pilot projects due to lack of sufficient past data on crop yields, wide variety of agricultural practices followed, ignorance and poverty of large masses of farmers and difficulties in working out appropriate premium rates for different crops and their varieties. There is difficulty in covering damages which may vary from field to field and one crop to another. The high premium rates and high cost of maintaining staff especially in the rural areas are some of the other hurdles in the adoption of the crop insurance scheme.

55.9.29 In this connection, it might be added that an Expert Committee on Crop Insurance set up by the Government in 1970, held the view that in the conditions prevailing in the country, it would not be feasible to introduce crop insurance, at any rate in the near future, as that would involve diversion of scarce financial and administrative resources on a significant scale from the more promising measures which raise agricultural production and at the same time reduce yield variability. The Committee, however, suggested that experimental schemes of voluntary crop insurance for selected crops merited attention. Accordingly, at this stage, the policy is to experi-

ment with pilot schemes on crop insurance on a voluntary basis through the General Insurance Corporation of India for certain selected crops in selected areas in consultation with the State Governments.

55.9.30 At present there are ten crop insurance schemes in operation in the country. These are pilot projects intended to test the feasibility of the scheme. The first of these projects was started in 1972-73 on Hybrid-4 cotton in Baroda district of Gujarat. Other projects were taken up in 1974-75. Four of these projects relate to cotton crop and five to groundnut. There is only a lone project in cereals, i.e., wheat in Maharashtra. Statewise, there are 4 projects in Gujarat and 2 each in Andhra Pradesh, Maharashtra and Tamil Nadu. The General Insurance Corporation is operating the scheme in collaboration with appropriate supporting agencies providing the necessary field services in the respective States, such as the State Fertilizer Corporation in Gujarat, East India Distilleries Parry in Tamil Nadu and the Fertilizer Corporation of India in Maharashtra. The results of the working of the scheme in the pilot projects are awaited. A list of the projects, together with the areas covered and premia paid, is given in Appendix 55.10.

55.9.31 Crop insurance secures the farmer against the loss of current agricultural income and not against the loss of capital assets such as farm cattle, machinery and warehouses which are important sources of that income. As viewed by the Expert Committee, 1970, "Demand for the insurance of capital assets can... be expected to be greater than for the insurance of crops particularly because the premium rates can be lower owing to the possibility of horizontal spread of risk in the case of capital assets". The Expert Committee did not go into the details of this aspect. Hence, we would recommend that this question may be examined in detail with a view to evolve a practical approach. We have dealt with the issue of cattle insurance in Chapter 28 on Cattle and Buffaloes.

55.9.32 The future of crop insurance depends on the experience gained from the working of the pilot projects. We, however, recommend that pilot studies should be organised for more crops, specially foodgrains, in the different regions of the country so that a complete picture of the feasibility of the scheme could be available for different crops and regions and the scheme introduced soon thereafter wherever possible. Insurance is most needed in areas with low productivity and wide fluctuations in yields. In these areas, the capacity of the farmers to pay high premium rates is low and hence these rates have to be kept low as a social welfare measures.

Crop insurance arrangements at a high cost for the farmers will be un-economical for them and, therefore, self-defeating.

Price Support

55.9.33 Apart from the risks discussed above, farmers are subject to another risk *viz.* the risk due to fall in prices. Substantial and sudden rise in production due to technological improvements and other favourable factors may lead to steep fall in price reducing the incomes of the farmers which acts as a disincentive to increased production. To remedy the situation and to serve as a long-term price guarantee, the Government is announcing minimum support prices for important crops. While in the case of foodgrains, the arrangements for ensuring the minimum prices are fairly satisfactory over large areas, in the case of commercial crops like cotton, jute etc., the arrangements need to be considerably improved. The details of price policy are dealt with in the Interim Report on Agricultural Price Policy.

Rewards and Social Recognition

55.9.34 Tangible rewards and social recognition of outstanding farmers who obtain the highest yields act as social incentives for adoption of improved agricultural practices and increasing productivity if the competitions are organised in the proper spirit. To promote a spirit of healthy competition among the farmers and to encourage them to adopt recommended agronomic practices to get high yields, a scheme of crop competitions for food crops was introduced in 1949-50. Under this scheme, crop competitions are held at the village, block, district and State levels by the State Governments and at the all-India level by the Government of India. The crops included in the scheme are paddy, wheat, bajra, jowar, ragi, gram, potato and arhar. The winner at the lower level competition is entitled to compete at the next higher level. The first six winners at the State level competition in a particular year are entitled to compete in the next year's all-India competition. Three all-India prizes are given for each crop. These are Rs. 3,000, Rs. 1200 and Rs. 800 for competitors obtaining the first, second and third ranks respectively. The first prize winner in each crop is also awarded a certificate of 'Krishi Pandit'. Crop competitions are also organised for sugarcane. The system of National Award Competitions, however, gets limited to a select few. It is necessary to institute a system of competitions which could have

a wider appeal. We suggest that certain yield standards could be laid down in each taluk or district and whoever attains these standards should get recognition. This would interest more farmers in these competitions. Such a system could be instituted in addition to the national awards and the extra expenditure incurred would be more than justified.

55.9.35 All-India competitions are also organised for fruit yields under which awards of "Udyan Pandit" are given to the outstanding fruit growers in the country. These competitions are held for the orchards of mango, banana, sweet orange, grapes, mandarin, apple, pine-apple and guava. The first prize winners are awarded a certificate of *Udyan Pandit*, a bronze medal and Rs. 5,000 in Government bonds. Those coming second in each of these competitions are awarded certificates of merit and Rs. 2,000 in Government bonds.

55.9.36 A scheme of all-India milk yield competition was introduced in 1956. Under this scheme, cash prizes are awarded to the participants obtaining highest milk yields at all-India, State and block levels. The main aim of the scheme is to create a spirit of healthy rivalry among cattle owners and breeders for developing high yielding strains of important breeds of cattle and buffaloes. A medal of special honour of *Gopal Ratna* is also awarded to the first prize-winner at the all-India level. There are also similar competitions for poultry.

55.9.37 The above mentioned schemes have undoubtedly acted as an incentive to the producers of crops, fruits, milk, eggs, etc. The competitions have also demonstrated the possibilities that exist for increasing the yields of the various crops, fruits, milk and eggs. We are of the opinion that these schemes have proved very useful and should continue.

55.9.38 Along with these crop competitions and rewards on their basis, there should be greater social and community recognition to innovating and enterprising farmers who have distinguished themselves by achieving greater productivity. The recognition could take the form of national, State or local level awards or decorations and should be given irrespective of the status of the farmer—large or small, rich or poor. The photographs and achievements of such farmers may be published in panchayat samiti or zila parishad offices. They may be invited to important national and State level functions.

Institutional changes

55.9.39 The greatest disincentive in agriculture arises from the

forms of land tenure which deprive a cultivator of the fruits of his labour and investment. A farmer will not put capital and labour in increasing production if he shares only partially in the increased returns. A built-in disadvantage occurs under many forms of share-cropping where the tenant contributes virtually everything except land while the produce is disproportionately shared by him with the landlord. Insecurity of tenure is another factor which inhibits agricultural development. If his tenancy is not protected effectively by law or custom, a farmer is not likely to make any medium or long-term investments for increasing the production nor will he have the same interest in building up the fertility of soil as a farmer with a secure tenure. The same reluctance occurs in the farmers who have no clear title to the land operated by them. We have dealt with the various policy measures and legislative and administrative actions required for removing these factors of disincentive in Chapters 66 and 67 on Land Reforms Legislation and Implementation and Agrarian Structure and Perspective.

10 SUMMARY OF RECOMMENDATIONS

55.10.1 The main recommendations are as under:

1. For maximum coverage of small and marginal farmers under the credit system for upgrading and modernising agriculture over the next 10 years, a ground level organisation should be built up fulfilling the credit system for upgrading and modernising agriculture over the services and ensuring a fair price for the produce and (b) operating fully on a commercial basis.

(Paragraph 55.3.20)

2. The major components of the new credit policy should be (a) to provide an integrated agricultural credit service to facilitate the adoption of new technology, (b) to extend its scope to all aspects of rural development (including livestock rearing, dairying, fisheries, farm forestry, sericulture, etc.) and marketing, transport and processing, and (c) to facilitate linkages between finance and services for current inputs and investments in land improvement, minor irrigation and farm equipment.

(Paragraph 55.4.8)

3. The first principle of agricultural credit policy should be that the activities financed for individual enterprises or projects, must have actual or potential financial viability. When necessary suitable organisational support should be provided to generate viability. The in-

stitutional and public resources used for capital investment and working capital must generate, over a period, adequate income for repayment of loan.

(Paragraph 55.4.9)

4. There should be a single source of institutional credit for all credit requirements of the farmers. Commercial banks can lend to the small farmers upto 12 years, when such lending is eligible for re-finance from ARC or other financial institutions.

(Paragraph 55.4.11)

5. There should be close integration of financing plans and lending between different agencies operating in the same area in the form of agreed lending norms, broad division of functions and collaboration.

(Paragraph 55.4.12)

6. Supply of credit should be integrated with the organisation and management of supply of inputs and services. Both should be entrusted to the same agency at the field level.

(Paragraph 55.4.13)

7. Institutional financial agencies should ensure that necessary credit facilities would be available to medium and large farmers promptly on normal commercial terms for all requirements.

(Paragraph 55.4.14)

8. In order to enable small and marginal farmers to catch up with the previous lag, weightage should be given to their needs and credit should be extended on preferential terms both in regard to interest charges and quantum of advances.

(Paragraph 55.4.15)

9. The commercial banks should enjoy the same authority and facilities in terms of statutory rights as financing institutions over defaulting borrowers and power to supervise and give directives to the borrowers for appropriate use of credit, as the cooperative banks *vis-à-vis* their role of financing primary cooperatives.

(Paragraph 55.4.16)

10. Necessary facilities should be given so that suspension of credit does not take place because of crop failures or market fluctuations. Adequate medium-term carry-over finance should be provided in dry farming areas to tide over bad years and the criterion of profitability over a period of years should be built into the system of credit.

(Paragraphs 55.4.17 and 55.4.22)

11. Effective credit service should help the farmer to reach self-sustaining stage as regards the requirements of working capital.

(Paragraph 55.4.18)

12. Farmers' service societies should be set up, one for each tehsil/

block or any other viable unit of convenient size with as many branches as are required in the area, to provide integrated agricultural credit service to the farmers. This service should be accessible to all small and marginal farmers and agricultural labourers who want to upgrade their technology. The FSS would be a registered cooperative body to ensure autonomy, efficient management and freedom.

(Paragraphs 55.5.1 and 55.5.3)

13. The FSS should have functions as listed in the paragraph. The FSS should take care of all the development needs of the small and marginal farmers and agricultural labourers, village artisans and persons tendering rural services.

(Paragraph 55.5.8)

14. The working capital of the FSS should be drawn from credit lines from the financing banks and proceeds and charges for services, reasonable trade margin on inputs, commission and fees from marketing organisations, margins on loans, etc.

(Paragraph 55.5.11)

15. The FSSs should develop close business relationship with other bodies such as land development banks and various corporations. Such institutions should play a vital supporting role in offering services to farmers to absorb credit for productive purposes.

(Paragraphs 55.5.12 and 55.5.13)

16. There should be a union of the FSSs at the district level for mutual consultation and coordination of policies. Where the production marketing and processing of any agricultural produce assume large proportion, separate functional cooperative organisations should be established. A close organisational and functional link-up should be established between the FSS and the functional cooperative organisations.

(Paragraph 55.5.16)

17. The State Governments and the cooperative departments should extend administrative and extension support to the FSS and direct and encourage them. There should be a clear demarcation of functions between the extension services, general planning and development agencies and the FSS.

(Paragraphs 55.5.17 to 55.5.19)

18. In areas served by the FSS the extension service should be the concern and responsibility of the Society. The group of technical experts at the taluk/tehsil level should help the extension cadre of the FSS in technical matters. There would be no need in these areas for a separate departmental agency. FSS should develop its own cadre with various hierarchical tiers so that right type of personnel get at-

tracted for serving the society.

(Paragraphs 55.5.22 and 55.5.23)

19. The FSS should not restrict itself to land-based cultivation. Diversification of business is important and provision of facilities for developing subsidiary occupations like livestock rearing, dairying, fisheries, farm forestry, sericulture, etc. should be encourage to benefit particularly weaker sections of the farming community.

(Paragraph 55.5.30)

20. The experience of the existing societies indicates the need for caution and proper phasing in the establishment of new societies so that by the end of the sixth year 2,520 societies are started on the lines indicated.

(Paragraph 55.6.11)

21. Forty-five per cent of the 1985 level of "graduated" requirements of short-term loans and 40 per cent of medium and long-term loans should be met by the end of the Fifth Five Year Plan itself. (The respective roles of commercial and cooperative banks has been indicated in Appendix 55.9—Statement VI, of the chapter). During 1975—85 the cooperatives will have to almost double both their short-term and medium and long-term credit and the banking system should work towards increasing their agricultural loans from Rs. 1,450 crores in 1978-79 to Rs. 4,050 crores in 1984-85. The Reserve Bank of India and the Government should immediately initiate planning for business and manpower development to equip them to achieve these targets.

(Paragraphs 55.7.10 and 55.7.11)

22. Storage and marketing system should be developed to keep pace with the expansion of output generated by credit services. Storage development, preferably by the FSS and cooperative sector, should start right at the farm. The negotiability of warehouse receipts, needs improvement.

(Paragraphs 55.8.2 and 55.8.3)

23. Location of new branches of commercial banks in rural areas should be related to concentration of small farmers to ensure reasonable proximity and mutual access. The banks and the cooperatives should give priority to the needs of the non-borrowing members lending credit with services.

(Paragraph 55.8.5)

24. Previous debts should be scaled down in the light of prevailing regulations regarding debt redemption. Outstanding amounts should be taken care of by the period of repayment being extended and by making production programmes of the farmers so broad based as to take care of repayment of not only instalments of old loans but also the due instalments of new loans. The FSS can help in observing

a discipline so that the genuine cases are disposed of fairly by a convention.

(Paragraph 55.8.7)

25. The concept of linking specific investments for local agricultural development with locally mobilised savings should be adopted. It should be possible to have specific schemes of a local nature ready for implementation from these resources.

(Paragraph 55.8.9)

26. Generally subsidies to individuals should be confined only to the weaker sections of the society such as the small and marginal farmers and agricultural labourers.

(Paragraph 55.9.10)

27. The policies for subsidies should be based upon the principles of selective application and subvention for those classes, sectors and key programmes that need support in the interest of balanced and quick development and in keeping with the objective of growth with social justice. The attempt should also be to use the intrinsic methods of motivation more and more and depend less upon the extrinsic ones, *i.e.*, subsidies etc.

(Paragraph 55.9.13)

28. Subsidies on export-oriented crops should be reviewed periodically and should be discontinued as soon as the purpose has been served and are no longer justified.

(Paragraph 55.9.15)

29. As demand for the insurance of capital assets can be expected to be greater than for the insurance of crops, this aspect may be examined in detail with a view to evolve a practical approach.

(Paragraph 55.9.31)

30. Pilot studies should be undertaken for covering more crops under insurance specially foodgrains in the different regions of the country.

(Paragraph 55.9.32)

31. The premium rates for crop insurance will have to be kept low in areas of low productivity and high fluctuations.

(Paragraph 55.9.32)

32. The arrangements for ensuring the minimum prices in the case of commercial crops like cotton, jute, etc. should be adequately improved.

(Paragraph 55.9.33)

33. A system of competitions with a wider appeal should be instituted in addition to the National Award Competitions, under which all those who reach specified yield levels should be recognised.

(Paragraph 55.9.34)

34. The competitions for crops, fruits, milk, etc. have proved useful and should be continued in future. There should be greater social and community recognition to innovating and enterprising farmers who have distinguished themselves by achieving greater productivity irrespective of their economic status.

(Paragraphs 55.9.37 and 55.9.38)

APPENDIX 55.1

(Paragraph 55.3.1)

Institutional Finance for Agricultural Development¹

(Rupees crores)

Financing agency	1969-70	1970-71	1971-72	1972-73	1973-74
I cooperatives:					
1 short term (primary societies)	488	515	534	575	610
2 medium & long term (societies)	52	59	74	100	125
3 land development banks	155	170	154	169	184
total cooperatives	695	744	762	845	919
II scheduled commercial banks "outstanding loans"					
1 short term	..	..	107	138	188
2 medium and long term	184	236	160	203	235
3 'indirect'	158	146	172	190	195
total commercial banks	342	382	439	531	618

¹1973-74 Report on Currency and Finance, Reserve Bank of India, p. 130, Table IV.39, Bombay

APPENDIX 55.2

(Paragraph 55.3.9)

Lending for Agriculture and Allied Activities *by Scheduled Commercial Banks—December, 1972 and December, 1973

State		Credit by distribution of utilisation			
		December 1972		December 1973	
		accounts '000	amount Rs. lakhs	accounts '000	amount Rs. lakhs
1	2	3	4	5	6
1	Haryana	13	721	19	1,041
2	Himachal Pradesh	1	22	3	82
3	Jammu & Kashmir	1	19	2	53
4	Punjab	18	1,094	25	1,668
5	Rajasthan	26	1,121	39	1,671
6	Assam	6	2,700	11	3,704
7	Manipur	(128)	2	1	9
8	Meghalaya	(254)	5	2	10
9	Nagaland	(8)	1	(8)	10
10	Tripura	(341)	12	3	70
11	Bihar	26	731	44	1,487
12	Orissa	13	165	25	336
13	West Bengal	56	5,775	91	6,806
14	Madhya Pradesh	42	1,038	59	1,729
15	Uttar Pradesh	54	4,647	78	7,032
16	Gujarat	69	4,035	84	4,813
17	Maharashtra	117	7,076	148	9,949
18	Andhra Pradesh	226	4,474	314	6,647
19	Karnataka	123	4,930	159	6,498
20	Kerala	183	1,860	235	2,576
21	Tamil Nadu	381	5,814	443	6,851
22	Goa	2	109	3	154

*BSR, December 1973, Table 13. Reserve Bank of India.

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APPENDIX 55.2 (Concl'd.)

1	2	3	4	5	6
23	Pondicherry . . .	12	131	14	172
24	Chandigarh . . .	(315)	3,061	(328)	2,132
25	Delhi	4	544	4	966
26	Others (Arunachal Pradesh, Mizoram, Andaman, Nicobar, Lakshadweep, Dadra, Nagar- haveli)	(68)	1	(273)	9
total .		1,373	50,088	1,806	66,477

NOTE : Figs. in brackets are the absolute number of accounts and *not* thousands.



APPENDIX 55.3 (Concl'd.)

1	2	3	4	5 (3+4)	6	7
other scheduled commercial banks						
1. number of accounts . ('000)	378	348	22	370	5	3
2. limits (Rs. lakhs)	17,377	4,265	2,133	6,398	398	10,581
3. outstanding (Rs. lakhs)	11,279	3,866	1,091	4,957	290	6,024
9.8 percent of total credits						



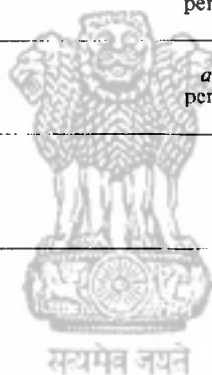
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APPENDIX 55.4

(Paragraph 55.3.13)

Direct Loans to Agriculture by Public Sector Banks
(as on March 30, 1973)

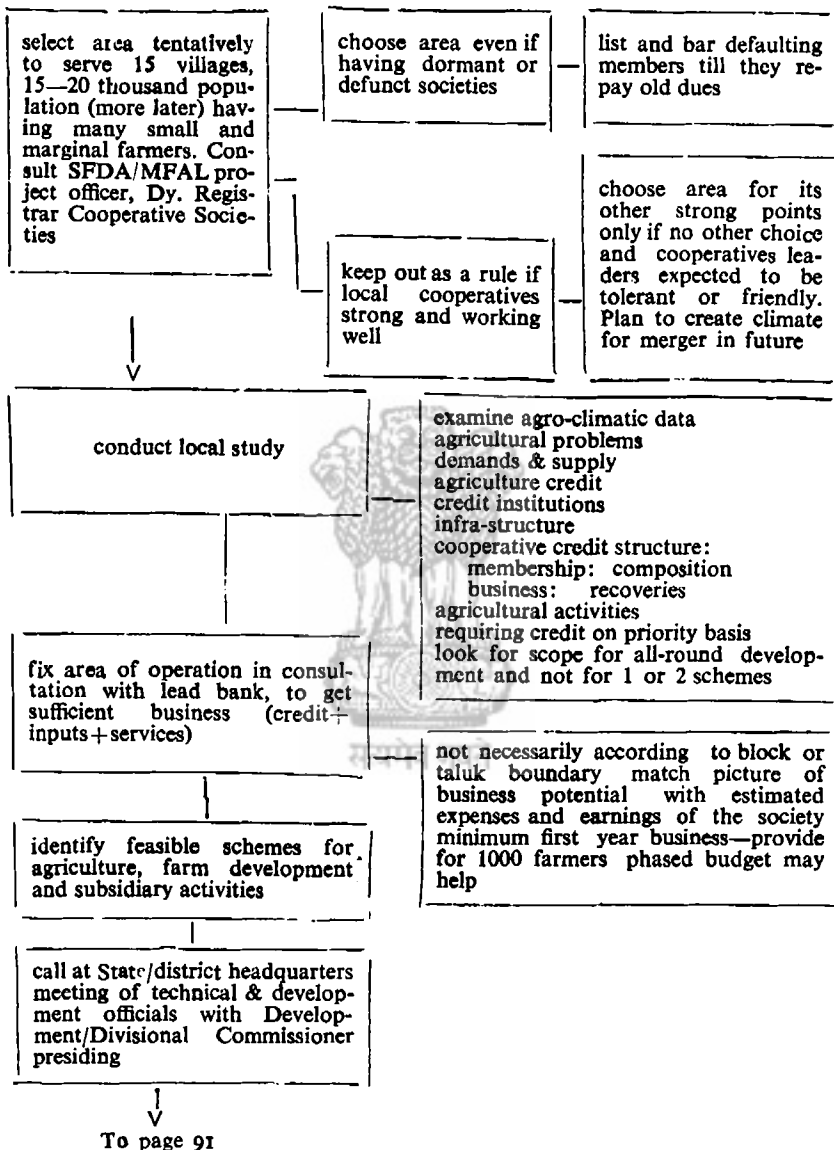
Item		Number of accounts (lakhs)	Amount (Rs. lakhs)
1. short term excluding plantations	<i>actual</i>	5.64	7,732
	<i>percentage</i>	(49.2)	(28.6)
2. term loans	<i>actual</i>	3.43	16,099
	<i>percentage</i>	(29.9)	(59.6)
3. allied activities	<i>actual</i>	2.39	3,178
	<i>percentage</i>	(20.9)	(11.8)
total		11.46	27,009
		(100)	(100)



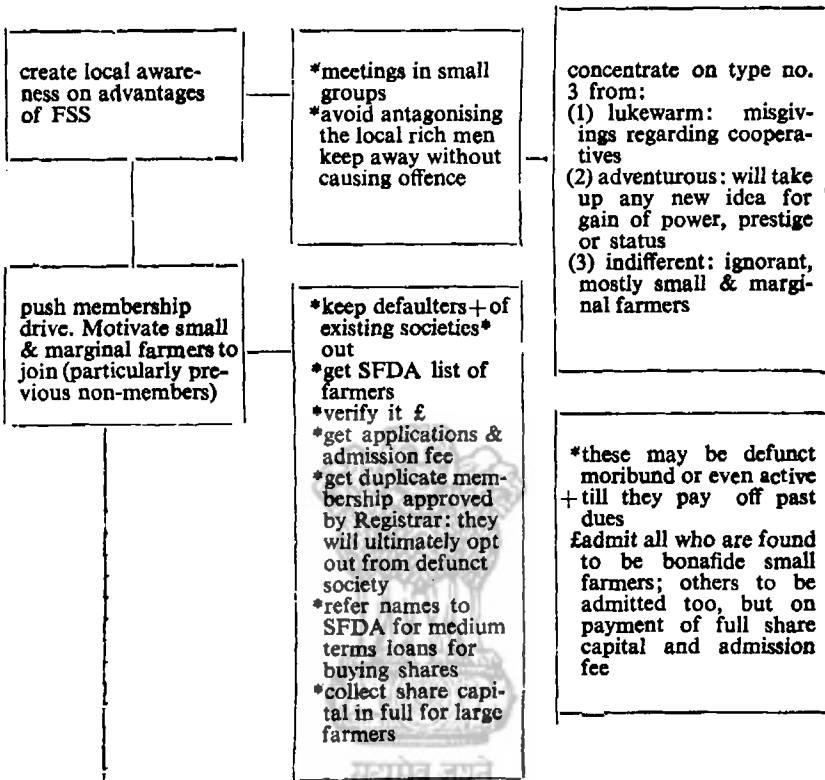
APPENDIX 55.5

(Paragraph 55.5.9)

Main Steps for Organising Farmers' Service Societies

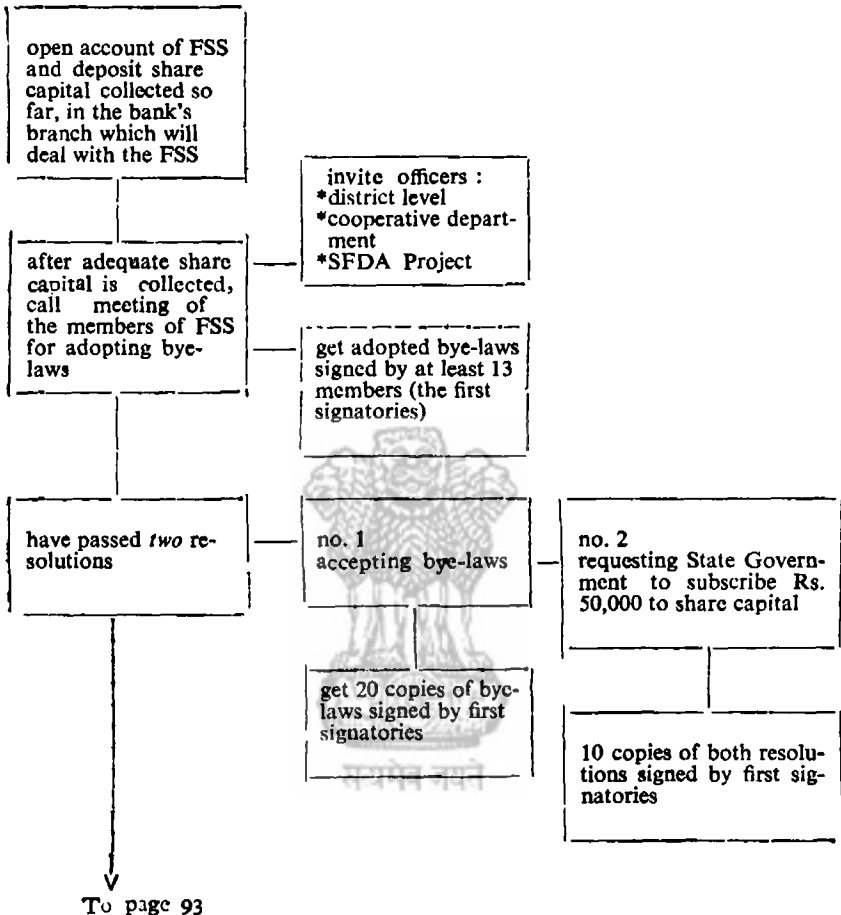


APPENDIX 55.5 (Contd.)

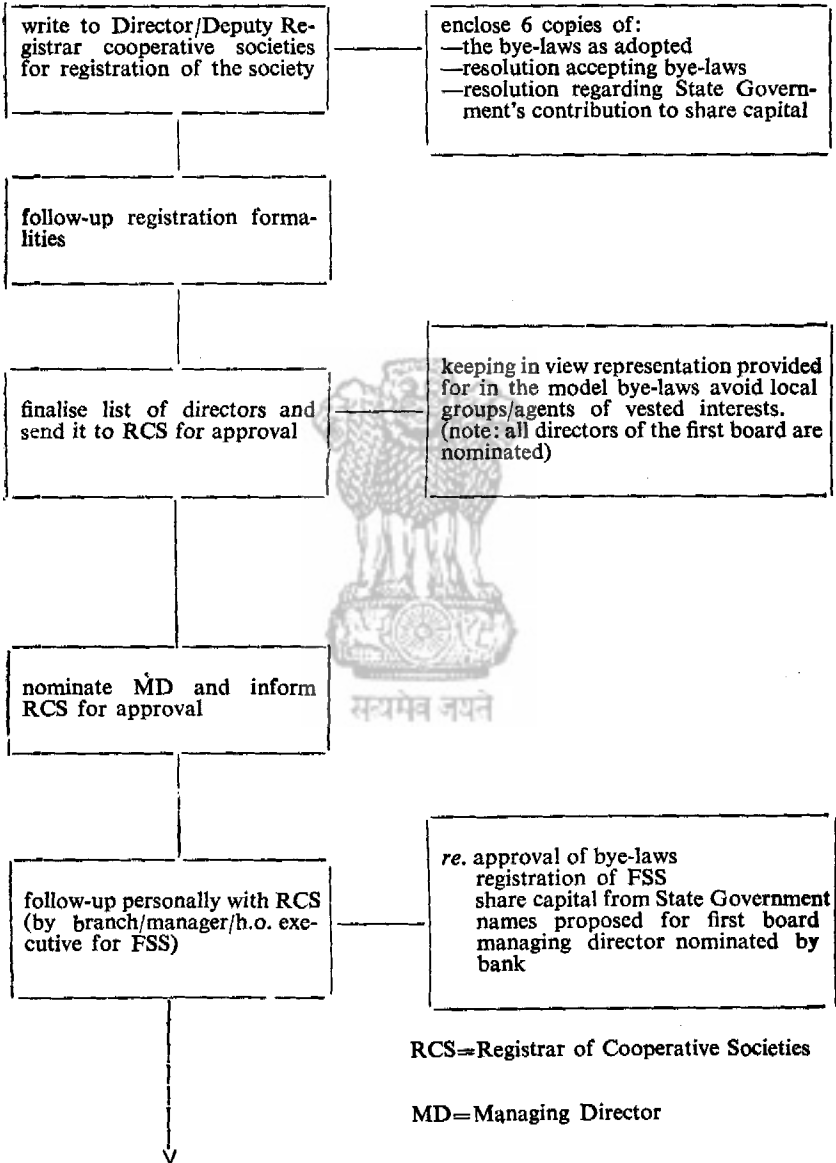


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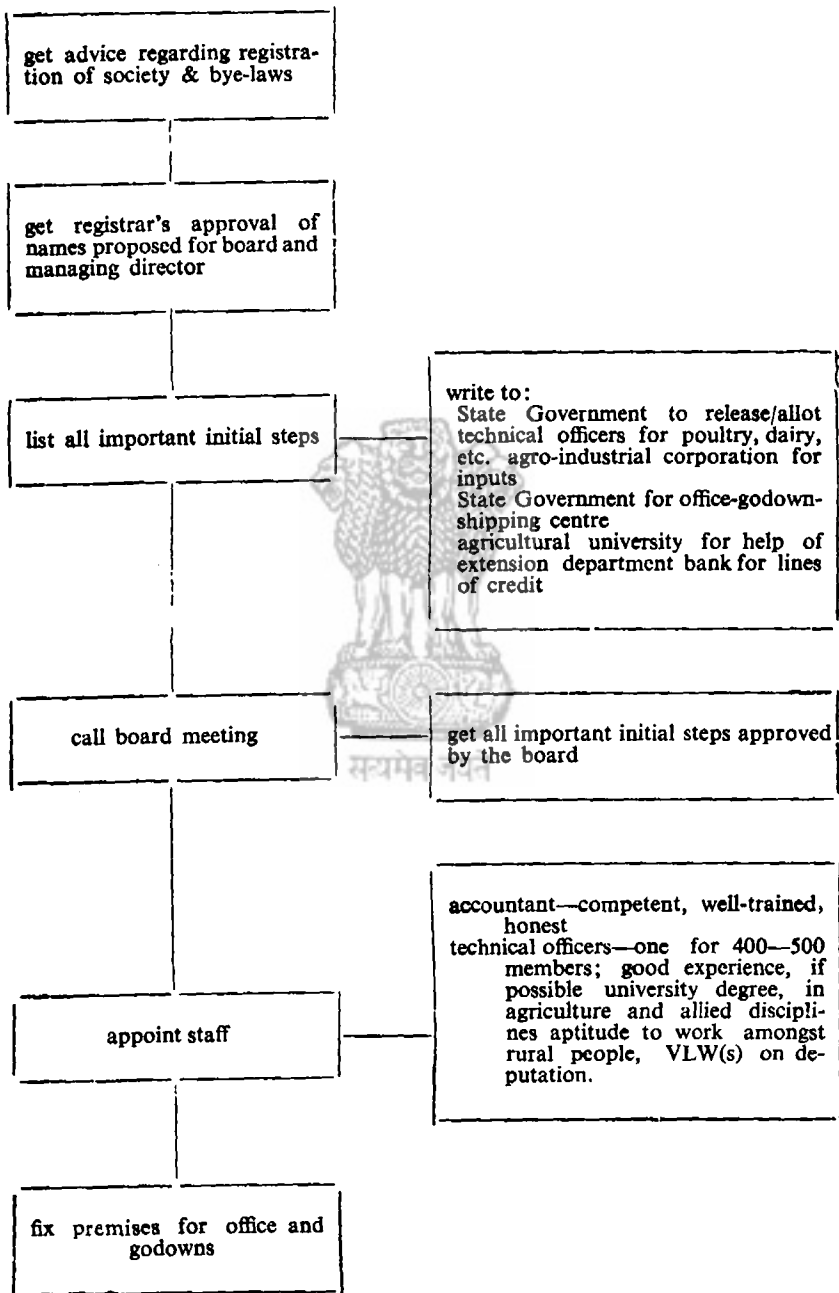
APPENDIX 55.5 (Contd.)



APPENDIX 55.5 (Contd.)



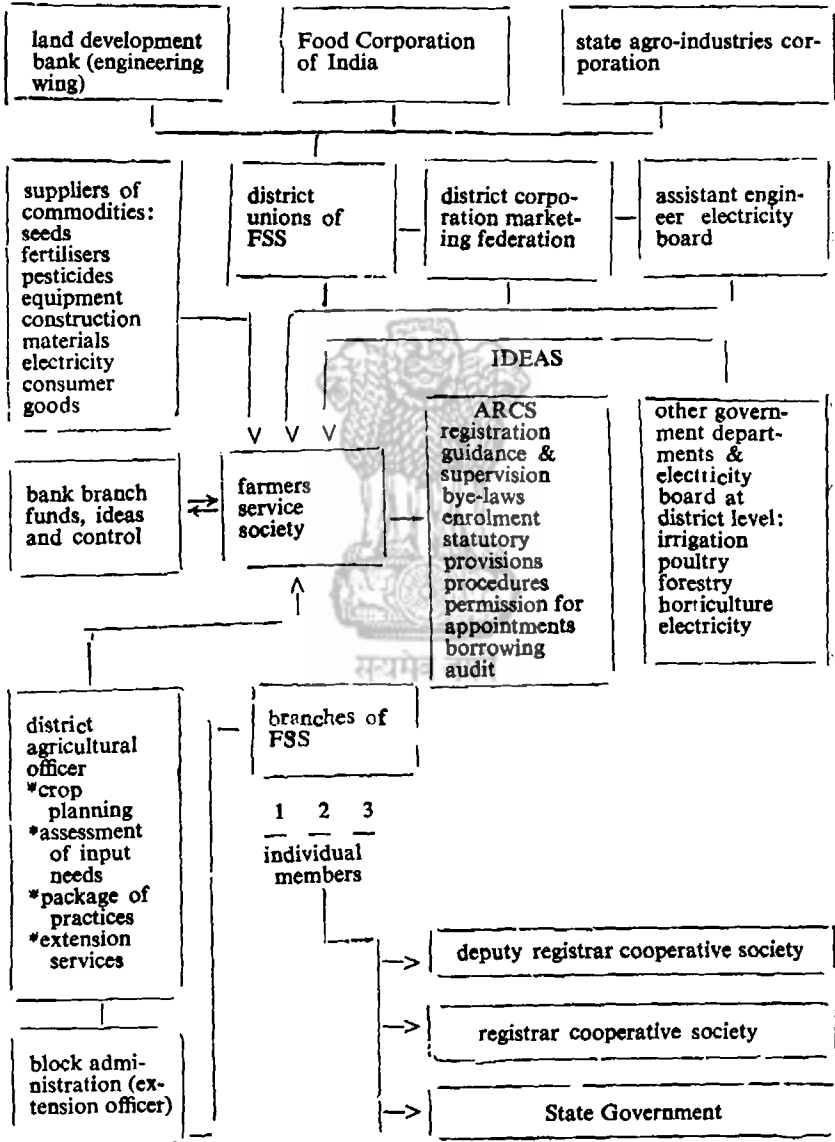
APPENDIX 55.5 (Concl.)



APPENDIX 55.6

(Paragraph 55.5.13)

Immediate Linkages of an FSS



APPENDIX 55.7

(Paragraph 53.5.24)

Economic Features and Business Potential of the Farmers' Service Societies

Statement I

Item	Block size FSS	Small size FSS
area of operation	100 Villages or a block	10 Villages
population	1,00,000	10,000
number of cultivating households (50%)	10,000	1,000
number of agricultural labour households (30%)	5,000	600
average holding size	3 acres (1.2 ha)	3 acres (1.2 ha)
assume 50% coverage of agricultural holdings in 5 years representing small farmers	15,000 acres (6,070 ha)	1,500 acres (607 ha)
cropping pattern	2 crops	2 crops
Major crop	paddy	paddy
average area to be covered per year	3,000 acres (1,214 ha)	1,500 acres (607 ha) in the first year itself
scale of finance for HYV*	Rs 350/- in kind	kind component + Rs 100/- cash component

*The credit requirement is calculated taking only short-term financing into consideration. However, medium and short-term mix depending on the need of the individual farm will be required in which case this would roughly equal to Rs 1.350/- per holding participating in the programme. Calculations are made on this conservative assessment.

APPENDIX 55.7 (Contd.)

Item	Block size FSS	Small size FSS
total money value of kind component assuming 100 per cent coverage and 1 crop for small farmers after 5 years	Rs. 52 lakhs	Rs. 5.25 lakhs
cash component	Rs. 15 lakhs	Rs. 1.50 lakhs
area under local varieties @ 25 per cent of the total holding (as second crop)	7,500 acres (3,035 ha)	750 acres (303.5 ha)
assumed credit requirement (scale of finance @ Rs. 200/- per acre)	Rs. 1.50 lakhs	Rs. 15,000
total credit requirement	Rs. 68.5 lakhs	Rs. 6.9 lakhs
returns from business		
margin at 2% on projected loan business	Rs. 1.37 lakhs	Rs. 13,800
margin on major supplies @ 2 per cent of kind component of advances	Rs. 1.04 lakhs	Rs. 10,500
margin on custom service and other auxiliary activities @ 2 per cent of the cash component of the advances	Rs. 0.30 lakhs	Rs. 3,000
total projected earnings in the 5th year	Rs. 2.71 lakh	Rs. 27,300

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APPENDIX 55.7 (Concl'd.)

(Paragraph 53.5 24)

Statement II

Designation	Salary per month Rs.	Block size FSS		Small size FSS			
		number of employ- ees	total month- ly bill	number of employ- ees	total monthly bill		
			1st yr. Rs.		6th yr. Rs.	1st yr. Rs.	6th yr. Rs.
1. managing director	750	1	750	1,000	—	—	—
2. assistant mana- ging director .	500	1	500	700	1	500	700
3. accountant .	350	1	350	500	1	350	500
4. clerks	200	3—7	800	1,500	1	200	250
5. godown keepers/ clerks .	200	1—5	200	1,250	1	200	250
6. peons .	125	2—7	250	1,000	2	250	300
7. field officers (one for 400 accounts @ 3 officer per year) .	400 *3—15	1,200	6,700	2	800	1,000	
8. total monthly bill		3,850	12,650		2,300	3,000	
9. total annual salary bill .		46,200	151,800		27,600	36,000	
10. travel allowance and other mis- cellaneous (20%)		9,240	30,360		5,520	7,200	
11. total bill .		55,440	182,160		33,120	43,200	
12. godowns and office (5 godowns)		10,000	50,000		5,000	5,000	
13. indivisibles (10% roughly) .		6,540	23,200		3,800	4,800	
total annual expendi- ture .		71,980	255,360		41,920	53,000	

*This number is directly proportional to the cultivating families participating in the FSS programme and only show the field officers required at the minimum business projected in a phased manner.

APPENDIX 55.8

(Paragraph 55.6.13)

Major Aspects of Preparatory Work and Decisions for the National Programme for Organising Farmers' Service Societies**1. Area of Operation :**

Selection of States and compact areas for groups of 20 FSS, initially for the first team and five teams to be prepared for the second year. Every year, similar selection will have to be made for the FSS proposed to be launched in the subsequent year. The process will have to be decided in advance. As far as possible, the area of operation should not cut across panchayat boundaries.

2. Over-all programme for six years :

In terms of number of teams at work, number of new FSS to be launched and number of resident trouble-shooters for groups of 20 societies already launched.

3. Composition of the first team.**4. Personnel : Selection, training & administration :**

- (a) characteristics for team members
- (b) composition of teams
- (c) characteristics for Managing Directors
- (d) design of selection process and time-phasing
- (e) allocation of responsibility for selection and training
- (f) terms and conditions of service, allowances, facilities and travel rules
- (g) relating incremental emoluments to performance (particularly in case of Managing Directors of FSS and resident trouble-shooters)
- (h) training goals and methods
- (i) stipends of team members and M.Ds. under training.

5. Functions of each team: The main processes upto the stage of preparing the FSS to be ready to start business.

6. Inter-team coordination: Policy direction, technical support and programming from central organisation.

7. Contract between central organisation, financing banks and State Government:

- (a) regarding what the spearheads teams will do clarifying 'performance guarantee' concept in respect of the teams as well as the resident trouble-shooter to be posted for 3 years for each group of 20 FSS

APPENDIX 55.8 (Concl'd.)

- (b) supporting action and facilities from State Government regarding:
 - (i) formation of FSS and their registration
 - (ii) contribution of share capital and the basis of estimating the quantum
 - (iii) reconsideration of absolute procedures not requiring statutory amendment
 - (iv) facilities for residential accommodation and transport on payment, for team members
 - (v) recruitment and release of extension personnel selected by society
 - (vi) quantum and period of subsidy for extension staff
- (c) arrangements with the financing banks:
 - (i) how many and which societies will be financed by each contracting bank
 - (ii) consultation regarding appointment of managing director or board members in the nominated board
 - (iii) general terms and conditions and procedures to be observed by FSS for different types of facilities
 - (iv) the main process for exercise of the bank's privilege to be kept informed and advise, supervise and direct the FSS as a client
 - (v) liaison at the stage of formation of the FSS
 - (vi) quantum and period of management subsidy to FSS
 - (vii) basis and timing of compensation to central organisation for services rendered: whether the fees should be related to total business, lending of the bank to FSS or interest received by bank from FSS—over 3 years? 5 years? spacing of instalments.
- 8. (i) budget for the total operation : on teams, training and supporting field infra-structure for the teams;
- (ii) provision and source of bridging finance; and
- (iii) rolling funds for stipend of managing directors under training.
- 9. The role, functions and funding of emoluments and expenses of the resident trouble-shooters.

APPENDIX 55.9

(Paragraph 55.7.2)

Assessment of Credit Requirements—1985

Statement I—Distribution of Operational Area by Size

(Mha)

Item	1971			1985		
	irrigated	unirrigated	total	irrigated	unirrigated	total
marginal and small farmers and agricultural labourers (i.e., small holdings upto 2 ha)	9 (31.0)	21 (19.6)	30	15	19	34
medium and large farmers (i.e., large holdings more than 2 ha)	20 (69.0)	86 (80.4)	106	32	79	111
all farmers	29	107	136	47	98	145

NOTE : Figures in brackets indicate percentage to total area.

(Paragraph 55.7.4)

Statement II—Coverage under Area Development Programmes in Irrigated Areas

(Mha)

Item	Covered under major & medium irrigation	Covered under minor irrigation	Total
1	2	3	4
(1) total area needing development as per present irrigation facilities	26	16	42
(2) already developed :			
(a) under paddy	11	5	16
(b) under other crops	7	9	16
(i) complete	2	7	9
(ii) needing improvements	5	2	7
sub-total (a + b)	18	14	32

APPENDIX 55.9 (Contd.)

Statement II—Coverage under Area Development Programmes in
Irrigated Areas—*contd.*

(Mha)

1	2	3	4
(3) to be developed:			
(a) backlog	8	..	8
(b) new areas expected to get water in 2-3 years	2	..	2
(c) needing improvements [ref. 2b(ii) above] .	5	2	7
(4) to be completed by 1985 :			
(a) from 3 (a) and (b)	8	..	8
(b) from 3 (c) (improvements)	5	1	6

[Paragraph 55.7.6 (iii)]

Statement III—Scales of Credit Requirements under Livestock & Fisheries
Development Programmes

Item	Number of farmers/units	Credit per unit (Rs.)		
		Short term	Medium & long term	Total
1	2	3	4	5
(1) milk production	(i) small & marginal farmers & agricultural labourers 5.70 mn (38,000 each in 150 districts)	..	500	500
	(ii) others : 0.30 mn (2000 each in 150 districts)	..	2,000	2,000
(2) piggery	(i) small & marginal farmers & agricultural labourers 2.20 mn	5,900	1,530	7,430
	(ii) others : 0.10 mn	11,800	3 060	14 860
(3) poultry	(i) small & marginal farmers & agricultural labourers 0.50 mn	1,560	1,800	3,360
	(ii) others: 0.25 mn	3,120	3,600	6,720

APPENDIX 55.9 (Contd.)

Statement III—Scales of Credit Requirements under Livestock & Fisheries Development Programmes—*contd.*

1	2	3	4	5
(4) sheep	(i) small & marginal farmers & agricultural labourers 0.42 mn	480	2,160	2,640
	(ii) others: 0.21 mn	960	4,320	5,280
(5) fishery development (Mha) (taken on the basis of 36% of the programme upto 2000 AD)	(i) small fishermen (1Mha) for short-term loans	Rs. 2,220 per ha	(ii) medium & long term loans (a) repair of existing ponds (0.54 Mha) @ Rs. 7,500/- per ha. (b) reclamation of fresh & brackish water swamps (36,000 ha each) @ Rs. 12,500 per ha.	

(Paragraph 55.7.8)

Statement IV—Credit Requirements for Agriculture for Full Programme Coverage—
Estimated Level by 1985

Item	Marginal & small farmers and agricultural labourers	Medium & large farmers	Total
1	2	3	4
1. short term loans:			
(a) for irrigated areas (old+new) area (Mha)	15	32	47
amount @ Rs. 600 per ha (Rs. crores)	900	1,920	2,820
(b) for unirrigated area			
area (Mha)	19	79	98
amount @ Rs. 450 per ha (Rs. crores)	855	3,555	4,410
sub-total (a+b)	1,755	5,475	7,230

Statement IV—Credit Requirements for Agriculture for Full Programme Coverage—Estimated Level by 1985—*contd.*

1	2	3	4
(c) allied activities (<i>vide</i> Statement III)			
(i) milk production (Rs. crores)	..	..	..
(ii) piggyery (Rs. crores)	118	118	236
(iii) poultry (Rs. crores)	78	78	156
(iv) sheep (Rs. crores)	20	20	40
(v) fishery development (Rs. crores)	222	..	222
sub-total (i) to (v)	438	216	654
(d) total : short term loans (a + b + c) (Rs. crores)	2,193	5,691	7,884
2. medium & long term loans:			
(a) irrigated areas (<i>vide</i> Statement II)			
(i) under major & medium irrigation new development (Mha)	2.48	5.52	8.00
amount @ Rs. 1,350 per ha (Rs. crores)	335	745	1,080
(ii) improvements in 2 (a) (i) Mha Amount @ Rs. 200 per ha (Rs. crores)	1.55 31	3.45 69	5.00 100
(iii) under minor irrigation :			
improvements (Mha)	0.31	0.69	1.00
amount @ Rs. 200 per ha (Rs. crores)	6	14	20
(iv) ground water development (Mha)	1.80	7.20	9.00
amount @ Rs. 10,000 per ha	180	720	900
sub-total irrigated areas (Rs. crores)	552	1,548	2,100
(b) unirrigated area (Mha)	19	79	98
amount @ Rs. 500 per ha	950	3,950	4,900
(c) total (a) + (b) (Rs. crores)	1,502	5,498	7,000

APPENDIX 55.9 (Contd.)

Statement IV—Credit Requirements for Agriculture for Full Programme Coverage—Estimated Level by 1985—*concl'd.*

1	2	3	4
(d) allied activities : (vide Statement III)			
(i) milk production (Rs. crores)	285	60	345
(ii) piggery (Rs. crores)	30	30	60
(iii) poultry (Rs. crores)	90	90	180
(iv) sheep (Rs. crores)	90	90	180
(v) fishery development (Rs. crores)	500	..	500
sub-total : allied activities (Rs. crores)	995	270	1,265
(e) total : medium & long-term (c) + (d) (Rs. crores)	2,497	5,768	8,265
3. total short-term & medium and long-term(1+2)			
1. short-term loans (Rs. crores)	2,193	5,691	7,884
2. medium & long-term (Rs. crores)	2,497	5,768	8,265
total :	4,690	11,459	16,149
4. machinery & implements			400
grand total			16,549

(Paragraph 55.7.9)

Statement V—Graduated Requirements of Credit—1985

(Rs. crores)

Item	Marginal and small farmers	Medium and large farmers	Total
1	2	3	4
I. short-term loan			
1. full requirements	2,193	5,691	7,884
(a) for area already and to be irrigated	900	1,920	3,820
(b) for unirrigated area	855	3.55	4.410
(c) for allied activities, i.e., dairy and livestock programmes of SFDA districts and fishery development	438	216	654

APPENDIX 55.9 (Contd.)

Statement V—Graduated Requirements of Credit—1985—*contd.*

(Rs. crores)

1	2	3	4
2. graduated requirements:			
(a) for already and to be irrigated areas	900	960	1,860
(i) 100% coverage by institutional system			
(ii) full loans for marginal and small farmers			
(iii) 50% for medium and large farmers to cover manufactured inputs			
(b) for unirrigated areas	428	1,066	1,494
(i) 50% coverage for marginal and small farmers and medium and large farmers			
(ii) meeting full needs of marginal and small farmers and 60% of medium and large farmers			
(c) for allied activities, i.e., dairy and livestock programmes in SFDA districts and fishery development	438	216	654
(d) total (a) to (c)—short-term loan	1,766	2,242	4,008
	(or 1,760) (or 2,240) (or 4,000)		
II. medium and long-term loans			
1. full requirements	2,440	5,756	8,596
(a) for area already and to be irrigated	552	1,548	2,100
(b) for unirrigated area	950	3,950	4,900
(c) for allied activities, i.e., dairy and livestock programmes in SFDA districts and fishery development	995	270	1,265
(d) agricultural machinery and implements			400

APPENDIX 55.9 (Contd.)

Statement V—Graduated Requirements of Credit—1985—concl'd.

(Rs. crores)			
1	2	3	4
2. graduated requirements:			
(a) for area already and to be irrigated—100% coverage by institutional sector and full loans	552 (138)	1,548	2,100
(b) for unirrigated area— (i) 50% institutional coverage for marginal and small farmers and also for medium and large farmers, (ii) full loan for marginal and small farmers and 60% of requirements of medium and large farmers	475 (119)	1,185	1,660
(c) for allied activities, i.e., dairy and livestock programmes in SFDA districts and fishery development.	995 (234)	270	1,265
(d) for agricultural machinery and implements			400
(e) total (a) to (d)—medium and long-term loans	2,022 (491)	3,003	5,425* or 5,400
III. Grand Total I+II	3,788 (491)	5,245	9,433 or 9,400

*Inclusive of Rs. 400 crores for agricultural machinery and implements.

Note (1) The graduated requirements include what the cooperative and commercial banking system covered by 1973-74 viz. Rs. 798 crores as short-term loans and Rs. 739 crores as medium and long-term loans.

(2) Figures in brackets indicate the quantum of subsidy.

APPENDIX 55.9 (Concl'd.)

(Paragraph 55.7.10)

Statement VI—Sources of Institutional Finance—1979 and 1985

(Rs. crores)

Item	By 1979			By 1985		
	Short term loans	Medium & long term loans	Total	Short term loans	Medium & long term loans	Total
1. total graduated requirements	1,800	2,200	4,000	4,000	5,400	9,400
less subsidy	..	200	200	..	500	500
net	1,800	2,000	3,800	4,000	4,900	8,900
1. commercial banks						
(a) opening level of business	188	430	618	600	850	1,450
(b) additional loans (+)	412	570	982	1,050	1,850	2,900
(c) recoveries over the period (—)	..	150	150	..	300	300
(d) outstanding at the end of the period (a+b—c)	600	850	1,450	1,650	2,400	4,050
(e) agricultural loans as per cent to total credit			10			15
2. cooperatives						
(a) opening level	600	300	900	1,200	900	2,100
(b) additional loans (+)	600	700	1,300	1,150	1,300	2,450
(c) recoveries (—)	..	100	100	..	300	300
(d) outstanding at the end of the period (a+b—c)	1,200	900	2,100	2,350	1,900	4,250
3. total 1(d)+2(d)	1,800	1,750	3,550	4,000	4,300	8,300
4. recoveries 1(c)+2(c)	..	250	250	..	600	600

APPENDIX 55.10

(Paragraph 55.9.30)

Pilot Crop Insurance Schemes in Operation in 1974-75

State	Crop insured	Area covered (hectares)	Net premium paid (Rs.)
Andhra Pradesh	groundnut (1)	288.03	20,161.00
	groundnut (2)	325.76	32,576.00
Gujarat	cotton H-4	197.10	22,174.00
	groundnut (1)	469.92	36,378.00
	groundnut (2)	356.61	42,890.00
	groundnut (3)	202.57	17,725.00
Maharashtra	cotton H-4	117.00	15,646.00
	wheat	76.86	3,689.00
Tamil Nadu	cotton—MCU 5(1)	226.40	20,129.00
	cotton—MCU 5(2)	81.80	6,135.00

सत्यमेव जयते

MARKETING, TRANSPORT AND STORAGE

There is an increasing awareness that it is not enough to produce a crop or animal product; it must be marketed well. Agricultural marketing is a process which starts with a decision to produce a saleable farm commodity and it involves all aspects of market structure or system, both functional and institutional, based on technical and economic considerations and includes pre and post-harvest operations, assembly, grading, storage, transportation and distribution. Increased production resulting in greater percentage increase in marketable surplus, accompanied by the increase in demand from urban population, calls for a rapid improvement in the existing marketing system. It is necessary to improve the marketing system to aid the process of agricultural development for two reasons: firstly if the additional produce does not move to the market to bring additional revenue to farmers, it may work as a disincentive to increase production; secondly if the system does not supply foodgrains and other agricultural commodities, such as oils, fruits, vegetables, milk, meat, eggs at reasonable prices to consumers at the time and place needed by them, increased production has no meaning in a welfare society. The objectives of an efficient marketing system are: (a) to enable the primary producers to reap the best possible benefits, (b) to provide facilities for lifting all produce the farmers are willing to sell at an incentive price, (c) to reduce the price spread between the primary producer and ultimate consumer and (d) to make available all products of farm origin to consumers at reasonable price without impairing the quality of the produce. In order to achieve the said objectives the emphasis in this chapter is on the need for development of a network of market facilities and cooperative marketing societies below the tehsil level. Besides the output marketing, which has received special attention because of the pre-eminence that the disposal of produce commands in the economy of a farmer, the salient aspects of input marketing have also been considered. Under output marketing, the problems of pre and post-harvest operations, processing, standardization and grading, market news and intelligence and credit have been dealt with in detail followed by problems specific to fruits and vegetables, livestock and livestock products, fish and minor

forest produce. The role of transport and storage in developing an efficient agricultural marketing system has also been considered. Lastly the improvements necessary in marketing education, research, extension and administration have been discussed.

1 MARKETS AND MARKETING INSTITUTIONS

56.1.1 Marketing in India starts traditionally either in the village or in the nearest *haat* or *shandy*, where the goods are exchanged into cash. There are in all about 22,000 *shandies* which serve on an average an area of 8 to 16 kms radius although some of the bigger *shandies* serve a wider area. There are at present in the country about 4145 larger markets situated either at tehsil headquarters, or in large villages or towns. These are variously classed at present as secondary markets or wholesale markets or assembling markets. For the country as a whole, on an average a secondary market serves a geographical area of 775 sq kms and a population of 1.32 lakhs. Wide variation is noticed in the location and area served by these markets. There is a market in Punjab for every 168 sq. kms as compared to one for every 1588 sq kms in Orissa. Most of the villages have to rely on *shandies* or *haats*. The traders came from the town, assemble for the day and disperse by the evening. They bring cloth and general merchandise usually of low quality but charge higher rates and the produce of the villagers is invariably taken at very cheap rates. In addition to periodical *haats* or *shandies*, there are the town based hawkers who visit the villages from door to door. The goods carried by them are also inferior and often represent imitations. There are no scruples involved in the matter of prices charged. There are representatives of big traders, who also visit villages periodically and enter into bargain with producers for purchasing their commodities, once again to the disadvantage of the latter. In short, an average villager is always a loser whether in purchasing or in selling. In the case of jowar, the differential between village and market prices per quintal in roadside villages of dry-cum-wet area in Tungabhadra Project was Rs. 1.75 while it was Rs. 6.55 in the isolated villages. If a villager chooses to come to town despite distance, he has to undergo fatigue and waste his time and even then he cannot be certain of a fair deal. This picture must change in order to enthuse confidence in the farmer for a better and promising future for himself and it is only then that he would wholeheartedly undertake to produce more.

56.1.2 The market should not be very far away from the village. It will be ideal if this facility could be created at a place as near as possible and in general within a radius of 5 kms, a distance negotiable by walk or cart within an hour. The existing 22,000 *shandies*, are meeting this requirement. What is needed in future is that these should operate every day at least during specific hours instead of once a week as at present. These facilities have to be brought under regulation. But in the absence of empirical evidence of volume of commodities traded and number of buyers and sellers, which influence the market revenue, it may not be possible to convert all these *shandies* into full-fledged assembly markets. Hence it is desirable to convert only some of these into full-fledged assembly markets and the others into sub-markets linked to the nearby regulated markets in a phased manner. Despite the fact that the number of *shandies* is quite large, some areas such as command areas of new irrigation projects, and drought prone areas may not be covered by them. In view of the crucial role played by marketing in such areas, it is necessary that sub-markets and assembly and whole-sale markets are organised in those areas. Area under irrigation will increase considerably in future. Similarly drought prone areas will be developed. These would increase the need for more facilities for marketing farm produce. Taking into account these developmental programmes, there will be about 30,000 markets by 2000 AD. At each of these sub-markets and assembly markets, we visualise certain minimum facilities to start with as indicated below:—

- (i) Physical facilities for grading, weighing and storage should be available in the market.
- (ii) There should be an agency which should take charge of the cultivator's produce, advance him money for his immediate needs, process the produce, arrange for further marketing at the next point and then make final payment.
- (iii) An alternative of personal dealing and disposal should also be available to the cultivator.
- (iv) There should be means of communication for market information i.e., Post and Telegraph Office with a provision for telephone.
- (v) Shops selling production inputs and domestic necessities should be available to the producer in the localities where markets are situated.
- (vi) Facility of inter-village and intra-village road communication should exist in the proposed market area. This aspect is examined further in a later Section.

56.1.3 In order to use a set nomenclature for markets, the *shandy*, which will be restructured, would be called an assembly market or sub-market. The markets, which exist at present in about 4,145 towns would be designated in general as wholesale markets. Some limited number of these latter markets situated in important cities undertake transactions of a big magnitude and even specialise in selected commodities, such markets are popularly known as *mandis* or terminal markets, which nomenclature could continue to be in usage. Among the existing secondary or terminal markets 2,936, i.e. about 70 per cent are regulated markets. This progress is the result of efforts, which have been going on gradually since 1930. Till 1930, efforts made in the direction of establishing regulated markets was sporadic. Based on the recommendations of the Indian Central Cotton Committee (1918) and Royal Commission on Agriculture (1928), the then various Provinces and States came forward to bring markets under regulation by enacting laws. Before the re-organization of States, market Acts were passed and enforced in about 9 States. After re-organization and by the end of 1974, Agricultural Produce Marketing (Regulation) Acts were in force in 18 States and 4 Union Territories. The growth of markets brought under regulation since 1931 is indicated in Table 56.1

TABLE 56.1

Markets brought under Regulation from 1931 to 1974*

State	1931-40	1941-50	1951-60	1961-66	As on 30-6-74
Andhra Pradesh	16	48	86	116	341
Bihar	..	..	..	45	126
Gujarat (a)	..	..	..	..	255
Haryana (b)	..	..	..	..	133
Himachal Pradesh	..	..	..	..	5
Jammu & Kashmir	..	..	..	..	..
Karnataka	8	31	72	89	213
Kerala	..	1	4	4	6
Madhya Pradesh	..	5	86	132	279
Maharashtra (a)	97	188	280	335	401

State	1931-40	1941-50	1951-60	1961-66	As on 30-6-74
Delhi . . .	..	..	3	3	6
Goa, Diu & Daman	..	..	..	..	3
Orissa . .	..	..	15	22	56
Punjab (b) . .	..	137	132	136	314
Rajasthan . .	..	..	..	47	172
Tamil Nadu .	14	22	37	81	142
Tripura . .	..	..	..	1	1
Uttar Pradesh .	..	..	..	1	437
West Bengal . .	NA	NA	NA	NA	44
Chandigarh (b) .	..	..	..	..	2
All-India .	135	432	715	1,012	2,936

Notes

*Data from : Directorate of Marketing & Inspection, Faridabad.

(a) The number for Gujarat is included in Maharashtra upto 1961-66.

(b) The number for Haryana and Chandigarh is included in Punjab upto 1966.

NA--not available.

The table indicates that the regulation of markets gained momentum only after, the country became independent. Steps have to be taken in future, not only to bring remaining assembling and terminal markets but also the primary markets under regulation. The regulated markets have brought considerable benefits to the producer sellers especially by preventing malpractices such as unauthorised deduction of market charges, falsification of weights and measures etc.

56.1.4 The functioning of the regulated markets during the last 2 to 3 decades has brought to the fore several aspects which deserve careful consideration and improvement. The conditions prevailing in regulated markets at present are briefly narrated below:

- (i) Each regulated market is administered by a market committee, consisting of representatives of growers, traders, commission agents and government. The representation of growers on market committees has been around 50 per cent in different States, but the Chairmen are not always the representatives of growers. The percentage of market committees having a grower as Chairman to total market committees has been 10 in Andhra Pradesh, 33 in Madhya Pradesh, 15 in Karnataka, 72 in Punjab, 36 in Maharashtra and parts of Gujarat and 40 in Tamil Nadu.¹ The other Chairmen are either traders, commis-

sion agents or Government nominees.

- (ii) Though by definition, in the Acts passed by State Governments, 'Agricultural Produce' generally means produce from crops, horticulture, livestock, forest, apiculture and pisciculture, many States did not notify most of these commodities for trading. The number of commodities notified by each market committee varies to a considerable extent. In some markets only one commodity is notified, whereas in some other markets as many as 76 commodities have been notified. Wheat was notified in about 705 markets at the end of 1966, whereas cattle trading was regulated in 185 and fruit-vegetables in 164 markets only.
- (iii) There is wide variation in the annual revenue and expenditure of markets within a State and from State to State. The income depends on the location of the market and the number of commodities notified, whereas the expenditure depends on the physical facilities provided and the number of staff working and their emoluments. It was found in a sample study in 1964-65 that the variation in income had ranged between Rs. 21,000 and Rs. 3,32,000 and the expenditure between Rs. 11,000 and Rs. 1,92,000 respectively.² In the same study it was found that the percentage of arrivals at the regulated markets to the marketable surplus in the area commanded by the market varied from 10 in Madhya Pradesh to about 66 in Punjab.
- (iv) The main source of income to a market committee is the market fees levied on products handled. In all the Agricultural Produce Marketing (Regulation) Acts, provision has been made empowering the market committees to levy and collect market fees on produce bought and/or sold in the regulated market subject to the maximum which has been prescribed in the Acts or in the rules framed thereunder. Previously the market fees used to be collected on quantum basis, but during the last few years the rules have been suitably amended empowering the market committees to collect the market fee on *ad valorem* basis. But there are some markets

¹. 1971. Working of Regulated Markets in India, Vol. II: pp. 38 and 68, New Delhi. Directorate of Marketing and Inspection, Ministry of Agriculture and Irrigation, Govt. of India.

². *Ibid.* 1, p. 164.

in Andhra Pradesh, Kerala and Karnataka where the market fees are still levied on quantum basis. The range of market fees varied from 0.10 per cent of value in Gujarat to 0.50 per cent in Bihar, Rajasthan, Punjab, Tamil Nadu and Uttar Pradesh. It is learnt that recently some States have raised this to 1.0 per cent and some to 2 per cent.

- (v) Three different patterns of market areas have been in vogue, limiting the boundaries of market area to:

- (i) one district
- (ii) one or a group of taluks
- (iii) a radius of a few kilometres round the market.

In a study conducted by the Directorate of Marketing and Inspection (DMI) in respect of 363 regulated markets it has been indicated that 17 markets in Andhra Pradesh and Tamil Nadu had the whole district as market area, 113 markets mostly in the States of Maharashtra, Orissa and Karnataka had whole taluk or a group of taluks as market area; 88 markets mostly in Punjab had one town as market area and 64 markets mostly in Maharashtra and Andhra Pradesh had villages in 8 Kms radius as market area.

- (vi) A survey of 439 markets conducted by the Directorate of Marketing and Inspection between 1970 and 1973 indicated that only 50 per cent of the markets had yards, 33 per cent had office buildings, 23 per cent had sale platforms, 10 per cent had their own godowns and 18 per cent had farmers' rest houses.
- (vii) In a large number of regulated markets, trading is conducted outside the market yard. Even the ownership of some market yards is vested with different organizations. A survey conducted by the Directorate of Marketing and Inspection in 1965 showed that out of 503 markets, only 208 market committees owned market yards.
- (viii) The staffing pattern of the markets varies from State to State. Secretaries of the regulated markets are officers lent from the Departments of Marketing and other subordinate staff are usually appointed by the market committees. The pay scales of Secretaries vary from State to State; even in the same State, there were different scales. The range was from Rs. 50—3—80 to Rs. 375—800.

- (ix) The qualification and training of Secretaries and other personnel vary from State to State and also within the same State in view of wide disparities in pay scales. For example, in Karnataka during 1969, though there were 89 market committees with 698 employees, only 81 were graduates and 413 matriculates.
- (x) There is no proper administrative machinery to supervise the trading practices to ensure payment to producers, and to prevent collusory practices by market functionaries. There is also no machinery to provide the much needed market information to improve the knowledge situation of market participants especially of producer-sellers.
- (xi) Only 395 regulated markets out of 2,936 have facilities for grading the produce at producers' level.
- (xii) Various systems of sale are in vogue in different regulated markets in the country. Even in the same market, different systems are applicable to different commodities. The systems of sale followed at present are : (a) open auction (b) sale under cover (c) open agreement (d) tender and (e) forward sales. Among the above mentioned systems, open auction system is the most common and popular method of sale. It is exclusively being followed for all commodities in 81 per cent of the markets whereas in the remaining 19 per cent of markets some commodities are disposed of by other systems also in addition to the open auction system.

56.1.5 It would be clear that even though the number of markets regulated might appear impressive in as much as it synchronizes approximately with the number of taluks and, therefore, gives an impression that at least a taluk headquarters on an average has a chance of having a regulated market, yet the functioning of these markets leaves much to be desired. The basic principles governing the structure and functions of regulated markets are well laid out in the Agricultural Produce Marketing (Regulation) Acts. There is ample scope within the Acts for effecting improvements to ensure orderly marketing at the existing regulated markets and the ones to be brought under regulation. Based on the conditions prevailing in the regulated markets as mentioned earlier, we recommend the following measures to improve the working of markets, which could be achieved by amending the existing Acts suitably, wherever necessary:

- (i) Adequate representation may be given to growers in the affairs of the market committee, they should have major

representations and the Chairman and Vice-Chairman of all market committees should invariably be representatives of growers.

- (ii) It is necessary to notify for regulation not only foodgrains but also commercial crops, fruits and vegetables, live-stock and livestock products, and minor forest products as a general rule.
- (iii) A minimum market fee may be levied uniformly on *ad valorem* basis, the rate to be decided by the respective State Marketing Departments taking into consideration the physical facilities provided and the developmental activities contemplated.
- (iv) From the point of administrative convenience, and also in order to give adequate representation to market participants and functionaries on the market committees, it is desirable to consider a revenue submission or a tehsil as a viable market area.
- (v) To ensure orderly marketing, each market should have an adequate yard, an administrative block to provide accommodation to the officials of the market committee, market functionaries, post and telegraph office, bank and trading floor. Within the market yard, there should be adequate facilities for grading, weighing and storage of all commodities.
- (vi) All the transactions of purchase and sale of notified agricultural commodities produced in the specified market area may be conducted within the regulated market yard only and not outside it in a scattered manner.
- (vii) To carry out the functions of the market, the officials who are vital are Secretary, Market Supervisor, Market Intelligence Inspector, Grading Supervisor and Auctioneer. All these officials should belong to the State Marketing Department.
- (viii) A seminar held in Mysore recommended the open auction system or the tender system depending on the local conditions. Commodities are auctioned at the platform in the premises of commission agents themselves. This procedure of conducting auctions separately at each Commission agent's premises is time consuming. The tender system of sale has one advantage over the auction system in that it is time saving. We are of the view that only open auction system and/or tender system should be followed in all the regulated markets. Auction should be

conducted only in the auction pit located in the market yard, where samples of different commodities in the custody of various commission firms should be displayed. This procedure would result in saving of time and would also enable the auctioneer of the market committee to conduct the sales.

If the above measures are implemented, we are of the view that the market income will be sufficient not only to meet the operational expenditure but also the cost of development. At this stage, we would like to voice a caution that we are not in favour of governmental grants, rather the markets must function on commercial principles in all respects. Therefore, the norms to be laid should be such that the burden can be borne by the markets within their own earnings. The 22,000 *shandies* which are to be developed either as assembly markets or sub-markets, and majority of which are likely to be below the level of taluka headquarters, will have to be treated on special footing by providing necessary finances to improve their physical facilities and working capital. These assembling markets and sub-markets may not be able to devote necessary funds for providing physical facilities in the initial stages. At present, provision has been made in some states like Andhra Pradesh, Karnataka, Gujarat, and Maharashtra, for providing financial assistance to develop those markets which are not in a position to undertake developmental activities from their own resources. These Governments have created a central market fund for this purpose, to which the market committees contribute a certain percentage of their income as prescribed and government contributes to the said Fund every year a sum which is equal to the amount of contribution made by the market committees. We feel that all State Governments should create a "Market Development Fund" to which market committees should contribute certain percentage of market revenue and the state governments contribute matching grants. Necessary provision has to be made in the Acts, wherever necessary. This Fund could be utilized for developing financially weak markets.

56.1.6 To develop the existing regulated markets, the DMI initiated a programme of Central assistance during the Fourth Plan to selected Market Committees at the rate of 20 per cent of the cost of development projects subject to a maximum of Rs. 2 lakhs. The programme is expected to be continued with an increased outlay during the Fifth Plan. Further, with the object of improving the physical facilities at the existing regulated markets and those markets likely to be brought under regulation, the Governments of Karnataka, Bihar, Rajasthan, Uttar Pradesh and West Bengal formulated projects for integrated development of markets and submitted their

proposals to Government of India and World Bank for financial assistance. The total cost of these five projects amounted to Rs. 84.16 crores. While in Karnataka all markets will be developed, in the other four States, the Plan covers only a small percentage of markets. The major portion of money would be spent on acquisition and purchase of lands for market yards, construction of buildings and cold storages, purchase of grading equipment and only a small portion of it is earmarked for improving market information service, market research and extension. These State Governments have indicated in their plans that the revenue of the market committees would substantially increase and that it would be possible for all these market committees to repay the loans received for development. Karnataka Government has already received the first instalment of loan from the World Bank and other Governments are expected to get the necessary financial assistance. The move of these Governments in formulating an integrated plan for development of markets is a step in the right direction. It is desirable that other States should prepare such plans for development of markets in a phased programme instead of attempting to improve only a few markets in isolation. The improvements in physical facilities at the regulated markets should also be accompanied by provision of necessary funds to employ an adequate number of qualified and trained personnel to operate the markets.

Marketing Institutions

56.1.7 For the sub-markets, the main job is how to take over the responsibility of the produce of the farmer and gave him the best of benefits and amenities without subjecting him to the intricacies of market transactions. In this regard, the primary cooperative marketing societies (PCMS) can render yeoman service. In a way, their growth is linked up with the history of cooperative institutions which had made an humble beginning with the establishment of a cooperative marketing society at Hubli in 1915 and at Gadag in 1917 in the old Bombay Province with the sole objective of improving the bargaining power of cotton growers in that area. In 1945, the Cooperative Planning Committee recommended that there should be one cooperative society for every 200 villages and that they should handle at least 10 per cent of marketable surplus, within 10 years. In 1951, the All India Rural Credit Survey Committee reported that the cooperative marketing system was highly unsatisfactory and that only one per cent of the marketable surplus of farm produce was passing through these institutions. In 1955, the State Ministers' Conference on Cooperation recommended that societies

should be established at all the assembly markets. The number of PCMS in 1957-58 was 1899 with the value of commodities handled being about Rs. 16 crores. The number of PCMS and value of commodities handled had risen to 3108 and Rs. 52 crores respectively by 1960-61. Since then, the rise in transactions has grown much faster, being Rs. 600 crores in 1969-70 from 3335 PCMS¹. The PCMS are mostly located at taluk headquarters, but are well integrated through an apex level organisation at the State headquarters. They do the job of buying and selling and also provide storage facility. It would be ideal if these PCMS open branches at the proposed assembly markets and sub-markets for having direct dealings with the producers there. They should be able to take charge of the producers' commodities and arrange to provide them appropriate returns in the manner as envisaged in the beginning of this section.

56.1.8 As explained earlier, the PCMS are not in existence at all assembly and sub-markets. In Chapter 55 on Credit and Incentives, we have recommended setting up of farmers' service societies (FSS) with the object of providing the much-needed service facilities specially to small and marginal farmers in rural areas. These FSS are expected to perform certain marketing functions such as:

- (i) pooling the produce of members,
- (ii) entering into contract with special produce marketing societies, and
- (iii) supplying inputs and services at reasonable prices.

We suggest that in locations where there are no full-fledged co-operative marketing societies, these FSS should act as marketing societies.

56.1.9 The FCI has a commanding position in the foodgrain trade. The objective has been to have control over prices of foodgrains, build up buffer stock to ensure stable price both for the producer as well as consumer. By March 1969, the FCI had taken over all the functions of the Directorate General of Food and was operating in almost all the States both on behalf of the Centre as well as State Governments. The Corporation is discharging its duties of buying, storage, transportation and selling of foodgrains with a countrywide net work of regional offices and purchasing points. At present, the FCI has four Zonal Offices, 14 Regional Offices, 124 District Offices and thousand of points for purchase and distribution of foodgrains. The Corporation is purchasing foodgrains through purchasing agents, cooperatives and millers under various procurement

¹. Mathur, B.S., 1971, Cooperation in India : p. 365; Agra, Sahitya Bhawan.

arrangements determined by the Centre and State Governments. The Corporation handles transportation and storage of imported food-grains also. Starting with a storage capacity of 0.628 million tonnes in 1965, it had an owned storage capacity of nearly 5 million tonnes by 1973. It started performing processing functions in the recent past and it is operating 24 modern rice mills, 30 mechanical paddy driers, a maize mill, a dal mill and a solvent extraction plant. By the end of Fourth Five Year Plan, FCI was performing almost all the physical functions of marketing in respect of foodgrains. In addition to fulfilling the welfare objective of the Government in meeting the requirements of the public distribution system the organisation has also been in a position to make some profits. Recently, some State Governments have also set up Food Corporations.

56.1.10 It is desirable that the FCI should strengthen its relationship with the PCMS and encourage them to perform this purchasing activity rather than maintaining too many purchasing points of its own. The Food Corporation of India should operate as a "giant balancing wheel" in the Indian economy by pouring foodgrains into the market, wherever and whenever required and withdrawing stocks from production areas, whenever the arrivals are at peak. The sole endeavour of the State Governments should be to (a) develop the PCMS and their apex organisations in order to be the most effective tools in building up an efficient marketing system below the town level and (b) strengthen the functional bond between the State apex body (which should be only one avoiding duplication) and the FCI. Besides the FCI, there are other bodies to deal with special commodities like the Cotton Corporation of India (established in 1970) and the Jute Corporation of India (established in 1971) which deal with the purchase, sale and import-export activities. These Corporations could also take the assistance of the PCMS in their activities at the level of the assembly markets and sub-markets.

56.1.11 As stated in the beginning of this Section, it is not desirable to provide only one channel of transactions, however, laudable that might be. It is better to provide an alternative channel also to a producer so that he could be free to make his own choice of dealings. The important functionaries already operating in markets are brokers, commission agents and traders. Broker's activity is confined only to bring together sellers and buyers to finalise sale and purchase transactions. Commission agents act as intermediaries to both sellers and buyers. They provide number of services, such as: weighing, storing and advancing money to sellers.

Commission agents pay the sellers the value of the produce after it is sold deducting the commission fees and other market charges. Traders buy on their own for resale or on behalf of processor. The activities of these functionaries can be continued to be made available as an alternative after streamlining with necessary controls. All the three functionaries are even now licensed in the regulated markets, but it is not so in other markets. In regulated markets, they have to pay licence fees as prescribed in the rules of the Act or as indicated in the bye-laws of market committees. The commission agents and traders are classified into three or four categories, depending on their trading activities and the licence fee also varies. In addition to licence fee payable annually, these two functionaries have to furnish cash security or bank guarantee. Besides, all the licensed functionaries are required to maintain regular accounts of all transactions in the proformas prescribed, and to send such reports and returns as and when called for by market committees.

56.1.12 There is need to make the licensing of all market functionaries compulsory without exception. Then, in view of limited service rendered, brokers should be phased out from the market; they could be persuaded to become commission agents. The weighing of produce should be done by the market committee. Only produce graded and weighed should be handed over to the commission agent according to the choice of the producer-seller. The practice of commission agent making payment to producer-seller is not a sound practice and a system of payment through banks located in all regulated markets has to be popularised. The present practice of issuing licences by the individual market committees to all functionaries has to be slightly modified in view of the fact that there are a number of commission agents and traders who operate in more than one market not only within a State, but in more than one State. In order to have control over their trading practices and prevent monopolistic and collusive practices, it is desirable that those commission agents and traders, who operate in more than one market within a State, should obtain licences from the State Agricultural Marketing Department of the concerned State and those operating at markets in more than one State should obtain licences from the Directorate of Marketing and Inspection, Government of India.

2 INPUT MARKETING

56.2.1 The principle of agricultural marketing becomes operative no sooner a farmer determines to sow a crop or begins

any other agricultural venture with a profit motive. In crop production, he must have at reasonable rates the timely supply of seed, fertilisers and plant protection chemicals. There should also be arrangements for the supply and service of farm machinery and implements. The Commission had issued two Interim Reports in 1971 and 1972 on Multiplication and Distribution of Quality Seed pertaining to High Yielding Varieties and Hybrids of Cereals and on Potato Seed respectively. In addition, policies relating to multiplication, distribution, processing, packaging, storage, transport and market intelligence have been discussed in Chapter 47 on Seeds. Governmental role in general is kept confined to promotional activities and rendering assistance without direct involvement, the seed business being allowed to develop on commercial lines. Private bodies and quasi-government autonomous institutions are required to deal with distribution of seed. It is suggested therein that agro-industries corporations could also participate in the marketing of seed.

56.2.2 There are separate Chapters, viz., 48 and 49, dealing with Fertilisers and Manures and Plant Protection Chemicals respectively. Fertiliser distribution has been considered so important that the Commission had also issued an Interim Report on the subject in 1971.¹ The manufacturing concerns have themselves been taking keen interest in the promotion of the use of fertilisers. The distributors have given preference usually to the areas of high demand or those which are easily accessible by railway or road. Therefore, we felt that the Ministry of Agriculture and Irrigation should give preference in its departmental fertiliser promotion scheme to the areas in the country which were not the main marketing centres of any of the producers of fertiliser and such areas where the promotional programme of the fertiliser producers was not massive enough. The main channels of distribution of fertilisers are through the State departments, manufacturers, cooperatives and the State agro-industries corporations. In March 1971 there were about 81,500 retail depots selling fertilisers. Out of these, about 31,000 were in the cooperative sector. In the case of plant protection chemicals, the most important agencies which handle distribution are the State departments co-operative societies and private traders. Farmers give preference to cooperatives and private traders in making their purchases. The distribution net-work is stated to be sparse at present. We have already made a recommendation in Chapter 49 on Plant Protection Chemicals that the farmer's service societies as recommended in the Interim Report on Fertilizer Distribution, Interim Report, National Commission on Agriculture.

commended by us in the Interim Report on Credit Services for Small and Marginal Farmers and Agricultural Labourers (1971), could be entrusted with the task of running input depots. This recommendation should be equally applicable to seed, fertilisers and insecticides or pesticides. It is also important that this facility shall be available at every assembling and sub-market. Another point, which needs specific attention and which has already been emphasised at relevant places in Chapters 23 and 24 on Horticultural Crops and Plantation Crops respectively, relates to the provision of the supply of inputs in small packs to suit the requirements of individual growers of crops like vegetables, ornamental plants, pepper and coconut. Insofar as the distribution of agricultural machinery/implements and spare parts is concerned, institutional arrangements through the State agro-industries corporations already exist and these seem to be working satisfactorily.

56.2.3 At present livestock and poultry feeds are distributed to farmers through co-operative societies, poultry farmers association and private dealers. In some States, co-operative milk unions and poultry farmers' associations supply feeds to their members, and deduct the cost of the inputs in instalments when these members bring their products for sale. We suggest that livestock and poultry feeds should be made available at all primary co-operative marketing societies which should also supply them on credit to needy farmers.

3 OUTPUT MARKETING

56.3.1 The sphere of output marketing starts with the very stage at which the economic produce attains a form in which it could be collected for further processing and exploitation. In the case of crops, this is the pre-harvest stage followed by post-harvest operations like threshing, winnowing and the succeeding operations of processing etc. In the case of livestock, they need special care before they are taken to market for sale. In this section, the problems common to all are discussed in the beginning and problems specific to fruits and vegetables, livestock and livestock products, fish and minor forest produce are dealt with later in this section.

Pre and Post-harvest Problems

56.3.2 The factor which governs the quality and quantity of harvested produce and over which farmers have no control is weather. The two major harvest periods are October-November and April-

May and during both these periods an acute shortage is felt of man and animal power for harvest and post-harvest operations. The resultant delay aggravates the situation of prolonging the period of exposure to weather conditions specially thunderstorms and hailstorms during April and May. The only effective way to save the produce as much as possible is through speedy operations by the use of machines. The problem is discussed further in Chapter 50 on Farm Power. Next to weather, there are losses due to ignorance of the right stage of harvesting. For example, wheat attains maturity at about 25 per cent moisture content. The existing practice is to harvest wheat when the moisture content of the grain is about 9 to 13 per cent, but a loss of 5 to 10 kg per hectare due to shattering and other factors takes place, with each day of delay in harvesting after maturity. In the case of paddy, the optimum stage of maturity corresponds to an average moisture content of 20 to 24 per cent. The loss in moisture content of a standing crop of paddy corresponds to 1 to 1.5 per cent per day and the optimal stage of harvest corresponds to 5 to 7 days earlier than the stage at which paddy is customarily harvested at present. A study carried out in the Paddy Processing Research Centre at Tiruvananthapuram in Tamil Nadu, indicated that changes associated with the ripening of paddy, i.e., yellowing of grain and loss of moisture from the kernel can be produced by spraying a 0.3 to 0.5 per cent salt solution on the ears of paddy and this could reduce the period of ripening to 2 days from the usual 15 to 25 days. In the case of oilseeds, on the other hand, there is a tendency to harvest the crop earlier than necessary in high economy rotations in order to have sufficient time for taking up necessary operations for sowing the subsequent crop. In the case of fruits, most of the orchard owners sell to pre-harvest contractors either at the flowering or fruit bearing stage. Under this system, neither the orchard owner nor the contractor is interested in improving cultural practices to minimize losses during fruit bearing stage. It is reported that fruit from sprayed trees has a longer storage life and is subject to less decay. To give an illustration, it has been observed that application of 100 PPM Naphthalene Acetic Acid, a week before harvest was effective in checking the berry drop in Bangalore Blue grapes and when the same chemical was sprayed three days prior to harvest over *anabeshahi* grapes, it reduced the berry decay by 75 per cent.- Pre-harvest spraying of grapes with either Captan 0.2 per cent or DCNA 0.2 per

1. Rao, M.M. and Koloigi, 1971. Controlling Wastage in Grapes; India Horticulture, Vol.16, No. 3; p. 4.

2. Subramaniam, T.M., et al, 1973. Controlling Storage decay in *anabeshahi*; Indian Horticulture, Vol. 18, No. 2; p. 10.

cent four days prior to harvest can control the storage decay.² There is need to conduct studies on all crops in a systematic manner and propagate the useful results among the farmers.

56.3.3 For post-harvest problems, an example could be given of sugarcane. In its case, the loss of weight due to desiccation and deterioration in juice quality occurs due to time lag between harvesting, chopping and crushing, and type of harvesting equipment used. Chopped cane shows more deterioration than the harvested whole cane. It is known that sugarcane pile covered with trash and sprinkled with water twice a day does not suffer any loss in weight and that spraying cut ends with a 40 per cent formaline solution inhibits the growth of bacteria at the exposed surface. Some examples could be given from amongst the spice crops. These commodities have a number of post-harvest problems such as drying of pepper berries to prevent microbial contamination; loss of essential oil during peeling and drying of ginger; using of cowdung to cook rhizomes and lead salt to brighten the colour of turmeric. The present practice of sun-drying of pepper berries is time consuming and causes microbial contamination. Therefore, there is need for designing suitable driers to reduce time of drying and prevent microbial contamination. Artificial drying of ginger with or without peeling to reduce loss of essential oil also needs attention and it is desirable that the use of lead salts in curing turmeric is discouraged. Mechanical driers can prove helpful in the case of a large number of crops and, therefore, these are required to be designed and popularised. The already known useful practices as represented by the example of sugarcane require to be published, but by and large there is need to make studies on methods to reduce avoidable losses during post-harvest operations.

56.3.4 There are certain post-harvest operations which are of a special nature, which need to be performed at the producers' stage itself before the commodity becomes saleable by him, e.g., curing of tobacco leaves and fibre extraction in the case of jute. The methods commonly followed in the curing tobacco are: rack-curing, ground-curing, pit-curing and flue-curing. At present, wood and coal are generally used for flue-curing Virginia tobacco and this goes to increase the cost. The real need in this regard is for effecting modifications in the design of the existing flue-curing barns so that their fuel efficiency could be increased and these could operate on cheap fuel sources.

56.3.5 Insofar as jute retting is concerned, the prevailing practice is to utilize any kind of water, wherever available, for this purpose. This deficiency stems from the paucity of slow flowing water near

cultivated areas. It is not a rare experience to see that a village having a community retting tank produces clean fibre with golden luster, while the adjacent village using same variety of jute but without similar retting facilities produces dark coloured, weak and inferior fibre. Sufficient water should be provided for retting, by excavating tanks, utilization of rail-road side ditches or using some other water management methods. While increased availability of retting tanks and concrete slabs for weighing down the plant under water are some of the alternatives, some mechanisation is necessary to achieve uniformity in quality. This may be done in two steps:

- (i) ribboning or decorticating the plant for separating the bark from the sticks so that only a small volume of water will be required to ret the bark; and
- (ii) evolving controlled retting tank for retting the ribbons under known conditions of temperature, PH and water flow for controlling the microbial action.

Some steps have been taken for fabricating a small machine for decorticating jute at the Jute Technological Research Laboratory, Calcutta. It should be the responsibility of the Governments concerned to establish ribboning and decortication service centres in each village in jute growing areas. Such units can be operated either through the village *panchayats* or Farmers' Service Societies.

56.3.6 There is a very thin line of division between post-harvest operations and processing insofar as the preparation of produce for marketing is concerned at the farmers' level. The two above mentioned examples of tobacco curing and extraction of jute fibre can very well be considered under processing too. Processing in its simplest form means to render a produce fit to enable the producer to get utmost sale value. In this context, cleaning, grading and standardization are the most essential preliminary components of processing. However, grading and standardization will be dealt with a little later in some detail. Except in the case of fruits and vegetables, milk and egg, pre-sale preliminary processing at producer's level need not necessarily render the produce to the consumable form for the buyer; the produce may have to be further processed, e.g. wheat to flour, whole pulse to *dal*, paddy to rice, cane to *gur* or sugar, *kapas* to lint etc. This stage of processing is now commercialised and it exists in all sizes of industry, viz., small, medium or large. Bodies like the All India Khadi and Village Industries Commission and the Small Scale Industries' Organisation of the Government of India help the small and medium sectors, whereas the big industries are capable enough to look after themselves but they have the Central and State Industries Departments too to help them and regulate their

activities. Processing also connotes the art of preservation of perishable products like fruits, vegetables, meat and fish through dehydration and canning etc. This aspect of processing has been dealt with separately in the next chapter.

56.3.7 Reverting to the first stage processing operations like conversion of wheat to flour, paddy to rice, pulses to *dal*, sugarcane to *gur*, raw jute to fibre etc., it may be noted that during the last 75 years, the number, size, capacity and ownership of processing units have undergone considerable change. Though a large number of owner-operated processing units located in rural parts continue to exist, many medium and large scale processing units have come up in private, cooperative and public sectors. The private sector still holds a commanding position especially in the case of paddy, wheat, cotton, jute, oilseeds and tobacco and processes more than 75 per cent of the produce. The share of the products processed by cooperatives in the total quantity processed was 7 per cent in rice milling, 9 per cent in cotton ginning, 11 per cent in cotton pressing, 4 per cent in oils and 26 per cent in sugar in 1965-66.¹ It was expected that the share of processing cooperatives would be 15 per cent in rice milling, 12 per cent in oil, 60 per cent in sugar and 25 per cent in cotton ginning and pressing by the end of the Fourth Plan. The manufacturers in the organised sector, who produce the finished product from the raw materials of farm origin, who are the prime purchasers of these commodities from farmers and who also control the supply of finished goods needed for consumption throughout the year, play a vital role in prices received by producers and prices paid by the consumers. The traders and millers buy in a market consisting of a large number of disorganised farmers, who are eager to dispose of their produce at the earliest date possible and control supply of finished commodities which are mostly essential in nature by releasing the product in the market in a manner which leads to high prices. Their capacity to manipulate things to their advantage is built on factors such as control of supply, localised monopolistic conditions and easy access to money. Various methods are available to improve this situation. These are: (a) setting up more well organized and efficiently operated processing units in the cooperative sector so as to produce not less than 50 per cent of finished goods, (b) linking of processing cooperatives with PCMS on the one side and consumer cooperatives on the other side, (c) formulation of 'marketing orders' and 'marketing agreements' between producers and processors to sell

¹. 1967. Report of the Study Team on Agricultural Administration. Vol. II: Annexure, page 758; Administrative Reforms Commission: New Delhi.

the commodities at pre-determined price, (d) encouraging small entrepreneurs in setting up small and medium scale processing units so as to introduce competitiveness in both factor and product markets and (e) increasing the coverage of operations of corporations like the Cotton and the Jute Corporations of India (CCI and JCI respectively). The last alternative is fully covered in our recommendations in the Interim Report on Agricultural Price Policy (1975), wherein we have recommended setting up of a single Agricultural Commodity Corporation of India for commodities other than cotton, jute and tobacco. For tobacco, recently a Board has been set up. Among other alternatives, the first should be given top most priority followed by the third.

56.3.8 The first stage of processing of commodities like paddy, pulses, cotton and sugarcane are now considered briefly. Rice processing consists of cleaning, storage, drying, par-boiling, shelling, hulling and polishing. Processing is carried by hand-pounding, or by use of different types of mills, huller-mills, sheller-mills and modern rice mills. All these follow the same process but employ different levels of technology in milling. A study by the Indian Institute of Management, Ahmedabad revealed that huller and sheller type mills are inefficient and that by modernising the existing sheller mills with a small additional investment, food losses can be saved. The out-turn of rice in modern rice mills is about 2.5 per cent higher than in traditional shellers and 6.5 per cent higher than in hullers. The higher out-turn of rice in the case of modern rice mills is also accompanied by qualitative improvement of by-products which is expected to fetch nearly 15 times higher price than that of the traditional hullers. Though the huller mills are technically inefficient and the cost of milling per tonne is high, since they are operated by small entrepreneurs in the rural areas, it is not desirable to phase them out immediately. Anyhow, there is a need to modernise the existing sheller mills whose capacity ranges only from 1 to 2 tonnes per hour and which are located in small towns to improve the efficiency of milling. In view of their huge capital cost associated with high operational cost, any decision regarding the number and location of modern rice mills both in the cooperative and public sector needs careful examination. The procurement, sale and pricing policies of the Government are factors that are important in modernising the industry. A positive approach would be to evolve a price policy which should provide stability to the marketing system and encourage modernisation.

56.3.9 Pulses have to be dehusked and split into *dal* before they are sold. Presently, it is done by the traditional methods where

the average yield of *dal* from pulses ranges from 65 to 75 per cent. These methods are time consuming and inefficient and the end-product has a low nutritive value due to scouring. The Central Food Technological Research Institute (CFTRI), Mysore, has recently developed an improved method for processing *dal* which is semi-automatic and independent of climatic conditions and the average yield of *dal* by this method is 10 to 20 per cent higher than the traditional method. The traditional *dal* mills need to be phased out and mills equipped with improved machinery based on the research findings of the CFTRI have to be established in predominantly pulse growing areas.

56.3.10 The existing ginneries and pressing units for cotton are very old and do not have standard pre-cleaning machinery viz. openers and extractors. About 90 per cent of the units are using roller-gins and only a few have installed saw-gins which are more productive. The cotton ginned by saw-gins produces a somewhat stronger yarn as compared to roller ginned cotton. But saw-gins are costlier since they are all imported. The number of ginneries and pressing units in the cooperative sector is small and the capacity of ginneries in the cooperative sector is about 28 per cent of the total ginning capacity. Since the existing ginneries and pressing units are old, it is essential to instal new type of gins and presses which can efficiently meet the processing requirements of long, extra long and finer varieties of cotton. We have already recommended in our Interim Report on Certain Important Aspects of Marketing and Prices of Cotton, Jute, Groundnut and Tobacco that suitable steps should be taken to encourage indigenous manufacture of gins and presses and to meet the immediate needs, the required allocation of foreign exchange should be made for their import over the next two to three years. There is need for increasing the capacity of ginning and pressing units in the cooperative sector so as to handle 50 per cent of the cotton produced.

56.3.11 Sugarcane is converted into *gur*, *khandsari* and crystal sugar. A large number of sugarcane crushers operate in the rural areas and of this a few are power operated and the rest are operated by bullocks. Nearly 58 per cent of the sugarcane grown was converted into *gur* and *khandsari* during 1970-71. *Gur* and *khandsari* meet the requirements of large number of people in rural areas. In view of the large number of sugarcane crushers which operate in the rural areas and provide employment opportunities to rural people, this sector needs encouragement. Efforts have to be made to improve the efficiency of these crushers by designing low cost small capacity crushers with crushing efficiency of 63 to 65 per

cent. The question of limiting the utilisation of cane for *gur* and *khandsari* needs careful examination in view of the bright prospects of sugar exports. In order to utilise the capacity of sugar mills to the maximum, the manufacture of *gur* and *khandsari* in areas around sugar mills may have to be restricted.

Expansion and Setting up of Processing Units

56.3.12 Though a number of processing Units utilizing agricultural commodities are in operation in various parts of the country, there is need to establish new processing units and/or expand the capacity of the existing units in rural areas from the point of view of providing employment to rural people. But there is need for undertaking feasibility studies before either expanding the existing ones or setting up new ones. This is to ensure that finance, which is a scarce resource in the country is properly utilised and also to operate the units to their maximum capacity which would result in lower per unit processing cost both in the short and long run. Some of the steps necessary in conducting feasibility studies are:

- (i) estimating the market potential of the processed product in various consumption areas;
- (ii) adequacy of availability of raw material supplies based on existing production and expected supplies due to producer's responsiveness to changes in price;
- (iii) comparison of different types of processing techniques by applying economic engineering techniques to determine the most efficient process and also examining the possibilities of lengthening the processing season through introduction of staggering of planting schedules, spreading sources of supply amongst areas of early and late maturity, and introduction of multiple-product processing; and
- (iv) determining the optimum number, size and points of location in a region taking into consideration the alternative costs of transport of raw materials to plant site from scattered regions of production and transport costs of processed material to urban areas and availability of infrastructure facilities etc.

The above four steps have to be followed in sequence and only when these give positive response a feasibility criterion has to be applied. The test of feasibility involves a comparison of estimated capital value, initial aggregate investment and operational costs. This test has to be conducted to find out the ability of the processing

industry to repay the initial investment in a limited time horizon plus a nominal rate of interest.

Grading and Standardization

56.3.13 Grading of commodities has three main purposes: Firstly, it protects the consumer and producers through the establishment of standards of quality. Secondly, it serves as a means of describing the quality of commodities to be purchased or sold by buyers and sellers all over the country. Thirdly, it provides a basis for the payment of premium on the quality of commodities. Trading on the basis of accepted quality standards makes pricing more precise and equitable thereby making the price reporting mechanism more meaningful. The Agricultural Produce (Grading and Marketing) Act was enacted in 1937. The Act empowered the Centre to prescribe grade standards in respect of any article which is included in the schedule of the above mentioned Act. Grading according to the standards prescribed under the above mentioned Act known as Agmark standards was purely voluntary. The parties who were willing to take advantage of these standards could apply for the grant of Certificate of Authorisation to take up grading in accordance with the prescribed standards. This Act was largely consumer oriented. Hence with the object of helping producers, grading at producer's level was introduced in 1963. Elucidatory rules for grading and marking of cereals, pulses and a number of oilseeds were formulated during 1964—66. A handbook on grading foodgrains and oilseeds, incorporating the above grading and marking rules, methods of analysis, sampling procedures, list of apparatus, equipment and instruments needed for inspection, sampling and analysis, and grade classifications was published in 1971 by the Directorate of Marketing and Inspection (DMI). The handbook indicated the varieties of foodgrains and oilseeds classified into a number of classes and grade designations based on maximum limit of tolerance of some acquired characters. So far, grade standards in respect of 95 items comprising commodities of crop, livestock and forest origin covering some 280 trade descriptions have been framed under the above Act, but in effect only about one per cent of the marketed surplus is subjected to any systematic grading for internal use and this almost wholly (nearly 90 per cent of the graded material) relates to cotton, wheat and oilseeds. Grading under the Agricultural Produce (Grading and Marketing) Act is voluntary. The Act requires the intending individuals or agencies to obtain a certificate of Authorisation from the Agricul-

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tural Marketing Adviser to the Government of India for grading and marking of commodities under "Agmark". Procedures have been prescribed for various commodities regarding grading, marking and packaging. Though grading is not directly done by the DMI or the State Marketing Departments, the grading staff of the DMI supervise the grading work at the authorised premises and issue appropriate Agmark grade labels to be affixed on the packages. Thus, any package graded under Agmark bears a grade designation label indicating quality of the contents. Besides, under the Rules the authorised packers allow the persons authorised by the DMI to collect samples of the graded produce for qualitative check at the central and Regional Agmark Laboratories.

56.3.14 It should be admitted that the enforcement of grading and standardization practices has been mainly directed towards exports. Realizing the importance of having standard grades for quality comparable with prices and also to ensure the quality of commodity intended for export, the Government of India introduced in 1942 compulsory grading and pre-shipment inspection of Sannhemp intended for export. Some time later this scheme was extended to tobacco. Since the Agricultural Produce (Grading and Marketing) Act, 1937 was a permissive one, compulsory grading and pre-shipment inspection of agricultural commodities intended for export is being done by taking recourse to the provisions of Export (Quality Control and Inspection) Act, 1963. The DMI is acting as Export Inspection Agency on behalf of the Export Inspection Council for compulsory grading and pre-shipment inspection. The total value of agricultural commodities graded under Agmark for export increased from Rs. 15.99 crores in 1951-52 to Rs. 29.03 crores in 1960-61 and Rs. 174.74 crores in 1973-74. The commodity-wise details are furnished in Appendix 56.1. The percentage of the value of commodities compulsorily graded for export under Agmark to the total value of exports was 17 per cent during 1967-68 and 20 per cent in 1973-74. There are about 40 agricultural commodities graded under Agmark for export and about 22 agricultural commodities are being inspected by agencies other than the DMI. Among the agricultural commodities graded under Agmark tobacco, sannhemp and castor oil constituted the major share. Besides the DMI, there are some other agencies too which are involved in formulating grades and standards, particularly for export. The Indian Standards Institution (ISI) formulates grades and standards for both agricultural and non-agricultural commodities and other equipment on a voluntary basis under the provision of Indian Standards Institution (Certification Marks) Act, 1952 as amended

in 1961. The Union Ministry of Health and Family Planning prescribes standards under the provision of Prevention of Food Adulteration Act, 1955; these standards are minimum and mandatory. The Export Inspection Council recognises the standards as formulated by other agencies. The Department of Food in the Ministry of Agriculture and Irrigation is empowered to issue licences and conduct inspection of processing units manufacturing a number of food products under the Food Products Order, 1955, the responsibility for which was transferred from the DMI to the Food and Nutrition Board in 1972.

56.3.15 Only about thirteen per cent of the regulated markets have facilities for grading the farmer's produce. Therefore, transactions that take place in the remaining regulated markets, and in *haats* and in villages, certainly relate to ungraded products and these really constitute the bulk of the market and produce at the initial level. This position requires to be rectified forthwith. Grading and standardization facilities must be provided at the proposed primary market centres without exception. At these points, the produce will be generally in an unprocessed form—paddy instead of rice, *kapas* instead of lint, groundnut pods instead of groundnut kernels etc. Individual lots will lose their identity as soon as they are purchased and bulked before being processed. Therefore, sophisticated and time-consuming grading tests are not required at this stage. Neither 'packing' nor 'marking' of the lots is involved at this stage. What is required is to quickly determine the quality of the produce on the basis of one or two recognised quality factors looked for by the buyers so as to help both the buyers and the sellers in making a correct appraisal of the market value of the lot in relation to the ruling market rates.

56.3.16 There is need to have a fresh look at the whole matter of grading of agricultural produce. The following principles are laid down for consideration:

- (i) Grading and standardization have to be made compulsory in all transactions relating to agricultural produce—whether at producer's level or for internal trade or for inter-State trade or for export trade. Samples of graded commodities have to be displayed in all the markets for verification both by graders and market participants.
- (ii) Grading and standardization must cover all kinds of agricultural commodities, viz., crops (including horticultural and plantation), livestock and livestock products, fish and fishery products and minor forest

products. Research studies need to be undertaken not only to formulate changes in the existing grades but also to evolve new grades for the commodities so far not covered.

- (iii) Overlapping of functions relating to framing of grades and standards for some agricultural commodities must be done away with. The instances of DMI, ISI and Health Ministry have already been given while discussing export. In addition, Government agencies concerned with procurement like the FCI, State Food Corporations, Civil Supplies Department, Primary Cooperative Marketing Societies, Central and State Warehousing Corporations have formulated their own sets of grades and standards which are different from those formulated by the DMI under the various rules in force. This duplication must disappear and the DMI should be the only authority entrusted with formulating the grades and standards.
- (iv) To make grading system efficient and foolproof graders should be well qualified and should be unconnected with either buyers or sellers; hence they should be the employees of the DMI or the State Marketing Departments in accordance with the division of responsibility.
- (v) The authority to enforce grading and standardization should be the DMI in the case of inter-State and export trade and the State Marketing Departments at producers level and for internal trade for all raw, semi-processed and processed products.

Market News and Intelligence

56.3.17 In order to enable the producer to get the full benefits from an efficient marketing system, requires to be fully kept posted with the day-to-day market situations as prevailing in the area of his concern. The market news system has to be so integrated as to cover all the markets—from the sub-market centre to the terminal market—which are likely to be brought under regulation by 2000 A.D. In so far as rapid communication media are concerned, we have suggested a telephone and telegraph network upto the lowest level of the sub-market centre. With this facility, it would not be difficult for the various strata of regulated markets to communicate with each other. The authorities at the market committee should disseminate information regarding prices and arrivals at terminal

markets at periodical intervals for the benefit of all participants and functionaries. This will enable the farmers to take correct marketing decisions. This will also help in evaluating the extent to which price movements in the terminal markets really get reflected in the prices received by the farmers. We have already referred to in Chapter 61 on Statistics the need for instituting Situation and Outlook Reports covering the various aspects of likely production, consumption, imports, exports prices etc. for different agricultural commodities. These Situation and Outlook Reports will help the farmers in taking correct decisions regarding the areas to be sown to different crops etc.

56.3.18 Besides the market intelligence of the above type, which is of great practical importance to the farmer, there are various kinds of data which are required in administration, planning, or studies of different types. These are briefly mentioned in Appendix 56.2. The improvements needed in the collection, compilation and analysis of these data are broadly discussed in Chapter 61 on Statistics. A few additional points needing attention are mentioned below:

- (i) Data on inter-State movement of agricultural commodities by road need to be collected through sample surveys or otherwise.
- (ii) The list of commodities for which detailed statistics of foreign trade are published should be reviewed in consultation with the Ministry of Foreign Trade to take note of the changes taking place in the import/export trade of the country.

At the Centre, the Directorate of Economics and Statistics (DES) is responsible for collection, compilation and dissemination of market intelligence. The spheres of responsibility between the DES and DMI are clearly demarcated. These arrangements are satisfactory.

Credit and Marketing

56.3.19 In modern marketing system, substantial credit is required to finance the flow of commodities through marketing channel. Working capital is needed for purchase of commodities by the traders and later by other agencies to meet the cost of transport, storage and processing of these commodities. Commercial bank finance is confined largely in providing working capital for trade and industry. They usually finance the trader during the post-harvest season for purchasing the commodities. There is no definite system regarding quantum of finance made available to the traders, Anyhow a rough idea can be had on the basis of figures available in

respect of security-wise advances for certain selected agricultural commodities. The commercial bank advances increased from Rs. 442 crores in December 1968 to Rs. 555 crores in December 1970 and Rs. 638 crores in March 1971. Bulk of this advance has been utilised for cash crops like cotton and *kapas*, sugar and raw jute. The above figures do not include food procurement advances made to procuring agencies like FCI and Cooperative Marketing Societies but include advances to Cotton Corporation of India and Maharashtra State Cooperative Marketing Federation. It is estimated that the commercial bank credit is available for about 10 to 15 per cent of the marketable surplus. Cooperative marketing societies need short-term credit for the following three purposes, viz., outright purchases, granting pledge advance to members and lastly for distribution of inputs. The cooperative usually provides the farmer about 70 per cent value of the produce that he brings for sale and the period allowed for sale is about 90 days. Re-financing facilities for this purpose are available from the Reserve Bank of India under the combined limit for seasonal agricultural operations and marketing of crops. As per recommendations of the All India Rural Credit Review Committee, the Reserve Bank of India decided to sanction separate credit limits for seasonal agricultural operations and marketing crops from 1971-72. The total advances made by cooperative banks for marketing of crops were Rs. 118.5 crores during 1967-68, Rs. 145.9 crores during 1968-69 and Rs. 169.7 crores during 1969-70. Apart from Central Cooperative Banks, the marketing societies also borrow funds from State Governments and commercial banks, including the State Bank of India. But these borrowings are for a number of purposes such as trading of inputs and hence do not represent the figures for marketing of agricultural produce alone. The cooperative banks also provide certain transitory facilities to cooperatives engaged in procurement of foodgrains on behalf of the FCI and State Food Corporations. These facilities are required to tide over the gap from the point of procurement from the farmers till the payment from the procurement authority is received. This gap is likely to be of 2 or 3 days at the most. The Reserve Bank of India operates a policy of selective credit controls against bank advances for seasonal commodities which are primarily aimed at ensuring that bank finance is not used for speculative holding of stocks which will have an inflationary impact. The important features of selective credit controls are: (a) fixation of individual overall ceiling in respect of advances, (b) margin to be maintained (c) rate of interest to be levied.

56.3.20 Commercial banks and the cooperative banks would be required to play a vastly expanded role in financing the orderly marketing of agricultural commodities in the coming years. This is particularly so in the context of the economy faced with a period of plentiful supplies. The market arrivals immediately after harvest are going to be substantially higher. The requirements of finance by cooperative marketing societies for granting pledge advances to members and for outright purchases need to be met so as to regulate arrivals in the market as one of the possible alternatives to stabilize prices. In addition the credit needs of agencies like FCI, CCI and JCI are likely to increase. The quantum of finance available to these agencies and those in the private sector would depend to a large extent on the availability of finance with the banking institutions and the policy of Reserve Bank of India (RBI) within the broad framework of fiscal policy of the Government. We feel that an advisory committee may be constituted by RBI to examine the credit needs of all agencies performing marketing functions, the terms of reference being:

- (i) quantum of credit to be made available to private, cooperative and public sector agencies.
- (ii) rate of interest to be charged to these agencies, and
- (iii) the number and order of priority of commodities for which credit is to be provided.

Fresh Fruits and Vegetables

56.3.21 Although general problems have been discussed in the earlier paragraphs, there are some problems specific to fruits and vegetables, livestock and livestock products, fish and minor forest produce, which need consideration. The perishable nature of fruits and vegetables is a risk that tends to discourage most of the farmers from taking their produce to marketing centres for sale. However, with the development of the assembly and sub-market centres the collection of the produce, its grading, packaging, transport, storage and sale in consuming markets will be greatly facilitated. The second critical factor is the lack of availability of credit, because of which village sales continue to be a significant feature in fruit and vegetable marketing. Sale of the produce of orchards at pre-harvest stage itself to contractors is quite common in most areas. There are only a few exceptions like the apple growers of Himachal Pradesh, who attend to the disposal of their produce directly through forwarding agents. Since the critical factor in this is availability of credit,

the Farmers' Service Societies can play a good role in organising credit facilities. The state marketing corporation also has been playing a leading role in the apple trade in recent years. Lastly, the conditions in the fruit and vegetable markets at assembling and consuming centres should always be watched carefully so that unfair trade practices like price manipulation, unauthorised deductions, etc. can all be prevented. Disguised monopolies and cartels are known to exist and operate in these markets to the detriment of producers. For example, about 35 merchants of apple at Delhi (of which about a dozen are more important) monopolise the entire apple trade of Jammu & Kashmir, Himachal Pradesh and part of Uttar Pradesh. There is need to have a Central legislation for their regulation. The Perishable Agricultural Commodities Act (1930) of the USA has been able to bring about immense benefit to the fruit and vegetable producers in that country. We recommend that similar Central legislation be enacted to suppress unfair and fraudulent practices in interstate trade of perishable agricultural commodities. This Act should apply to commission firms, brokers, traders, operators of cold storage and truck operators who handle fresh or frozen fruit and vegetables in interstate trade.

Livestock

56.3.22 Livestock are sold at fairs, haats, daily and weekly markets. In fairs, livestock meant for draught purposes predominate, whereas in *shandies* and daily markets, dairy animals and those meant for slaughter purpose predominate. Cattle, sheep, goats and pigs intended for slaughter are usually sold in *mandis* located in sites adjoining slaughter houses. The sellers in fairs and *shandies* are mostly farmers, whereas petty merchants predominate as sellers in *mandis* located in cities and big towns. For example, sheep and goats are brought to slaughter house in Bombay not by the primary producers, but by petty merchants from far off places like Uttar Pradesh, Madhya Pradesh, Rajasthan and Andhra Pradesh. In all these markets except for 185 regulated markets, physical facilities needed for orderly marketing, are non-existent. Market functionaries are not licensed and trading is done without any supervision. The price is settled mostly under 'cover' through brokers. The local bodies usually collect nominal fees for every livestock brought for sale. At fairs and *shandies*, as the sellers are mostly farmers, these places can be classified as primary markets. It is desirable to strengthen them. The State Marketing Departments should provide temporary physical facilities for yard, housing and handling livestock.

They should depute necessary personnel such as market supervisor, market intelligence inspector, grading supervisor and auctioneer when fairs and *shandies* are held. All market functionaries should be licensed at these cattle fairs and *shandies* and trading should be regulated as per rules and regulations of the Agricultural Produce Marketing (Regulation) Acts in force in the respective States.

56.3.23 Daily markets held in cities and towns, should be brought under regulation. Since at these daily markets different classes and type of livestock such as cattle and buffaloes meant for draught, dairy and slaughter purpose as well as sheep, goats and pigs intended for slaughter are sold, separate physical facilities for housing the different types and classes are needed. They should provide separate facilities for cleaning and disinfection. It is likely that the overhead charges in these markets might go up because of this reason and it may not be economically feasible to operate regulated markets for livestock in all small towns. It will not be desirable to allow trading of livestock in the same market yard along with other commodities; hence separate space should be earmarked in the market yard. In small towns where only a few livestock are slaughtered daily, it may not be economical to provide separate facilities for orderly marketing. It is desirable to depute one official of the market committee to slaughter house early in the morning to supervise the sale of livestock.

Meat

56.3.24 Marketing of meat covers all activities involved from the point the producer sells meat animals to the first buyer and extends up to the stage when meat and other by-products reach the consumer. All aspects pertaining to meat production, and type of slaughter houses needed for different locations in the country have been dealt with in Chapter 36 on Meat Production and Animal by-product.

Wool

56.3.25 The production of raw wool was estimated to be about 34 million kg. in 1971. Out of this, about 43 per cent was of apparel quality and remaining 57 per cent of carpet quality. Wool in raw state is an admixture of different qualities and colour besides containing foreign matter such as dirt, cow-dung, thorns and vegetable matter. Wool is shared by hand-shearers to a large extent even now. Washing, removal of thorns and burrs is not being carried

out at the shearing floor at present. Wool is graded under the Wool Grading and Marketing Rules, 1956. Grading of wool based on other attributes, such as: fineness, staple length, burr content and colour in addition to type and cleanliness of wool was introduced in Rajasthan in 1964 under an FAO/UNDP project, and was later extended to seven other States. Under this system, there are 90 grade standards. Under the UNDP project, the Animal Husbandry Department collected wool from producers, graded and transported it to important markets like Ludhiana, Hissar, Mirzapur, Panipat and Bawar for being auctioned there. The producers of wool were paid on the basis of prices received at these auctions after deducting costs of grading, transportation, storage etc. There were about 30 grading centres and 25 auction centres in these States. It is learnt that only 13 per cent of wool produced in Rajasthan passed through this channel, whereas in other States not more than 1 per cent of wool produced passed through this channel. For the country as a whole, not more than 2 per cent of wool has been handled by the State Governments. As recommended in Chapter 30 on Sheep and Goat the State Animal Husbandry or Sheep and Wool Department should not undertake grading and marketing activities relating to wool; it should concentrate on developmental activities of improving sheep breeds to produce superior quality wool. In view of limited number of buyers for wool at all the markets and also due to small quantities available with individual producers, the PCMS or the Wool Boards should come into the picture and arrange for marketing. The PCMS or Wool Boards should also undertake to help the migrating sheep breeders, who at present shear and sell wool enroute to village merchant, who pays them immediately. In the same chapter we have recommended that statutory wool boards have to be constituted to take the responsibility of grading, warehousing and marketing of wool. We have also indicated that the present system of grading at producers' level is cumbersome and should be revised to have lesser number of graders. The PCMS could also make immediate payment based on current market prices in important wool markets through bank pass books as recommended in the above mentioned Chapter.

Hides and Skins

56.3.26 The chief source of hides is from fallen animals, whereas skins are mainly derived from slaughtered animals. Most of the hides and skins flayed in rural parts are sold in the villages itself by *chamars* to village merchants or at *shandies*. At slaughter houses these are usually sold to merchants or representatives of

exporters by contractors. The prices received by the *chamars*, at villages and *shandies* have no bearing on the current market prices. The prices at the slaughter houses are mostly fixed on some agreement which does last normally for a period of 3 to 5 months. No grading of hides and skins is done at this stage of sale. Prices of hides and skins are mostly based on sex and age of animal, weight, mechanical and biological defects and methods of curing. In view of the small number of hides and skins sold by individuals at villages and *shandies* and number of buyers being very few at these markets, the question of *chamars* or butchers getting a fair price is ruled out. The only alternative is for the PCMS to come in for immediate cash payment based on the current market price. The way to improve the prospects of producers of hides and skins is through effecting improvement in quality. The usual defects of faulty flaying which affect the quality of the material and thereby the prices are cut flay and adherence of extra flesh. The defective flaying is due to factors such as inexperienced flayers, use of unsuitable knives, inadequacy of space and lack of arrangements for hoisting carcasses and poor lighting arrangements. Setting up of proper flaying centres and training of flayers and butchers with due licensing is the only remedy. Secondly, curing methods also require improvement. The common methods of curing are drying with or without frames followed by treatment with arsenic to prevent insect damage, wet-salting and dry-salting. Drying of hides on the ground produces a very poor quality of material. Instead, 'suspension' method of drying, which is also inexpensive, should be popularised. Curing of skins with common salt is the best method of preservation of hides and skins.

Poultry and Eggs

56.3.27 Poultry industry has made rapid progress in the last twenty years. The total number of poultry increased from 73.55 million in 1951 to 136.77 million by 1972. The annual production of eggs increased from 2,881 million average for the period 1961—65 to about 6,040 million by 1971. In the earlier years, farmers used to keep a few birds in their houses and used to sell eggs and hens in villages and/or *shandies*. During the last 15 years, poultry farming has been taken up by private individuals on commercial lines and a large number of poultry farms have sprung up in rural parts around cities and towns. In the earlier days, poultry meat was a by product of egg industry, but in recent years a large number of farmers are specializing in rearing poultry for meat only. Farmers having only a few birds continue to sell eggs and birds at villages

or *shandies*. Large commercial farmers dispose of their produce either directly to bulk consumers or to poultry farmers' association or sell at terminal markets to egg auctioneers. In some States, the Departments of Animal Husbandry have set up egg marketing centres. Marketing co-operatives have been set up in Gujarat and Rajasthan. Maharashtra Agricultural and Fertiliser Development Corporation (MAFCO) has been promoting sale of eggs and broilers in city of Bombay. They have set up a poultry processing plant at Poona which has a capacity to process 8000 birds per day and has also facilities for frozen storage. Recently a processing plant with capacity of 4,800 birds per day has been set up at Chandigarh. Besides, small processing plants numbering 15 in all have been set up in some States. The setting up of National Egg and Poultry Co-operative Marketing Federation with four associated egg collecting and grading centres at Delhi, Bombay, Calcutta and Madras has been proposed during the Fifth Plan. At present, eggs are being graded only on size under Agmark by poultry farmers' association and marketing centres set up by Departments of Animal Husbandry. No grading of birds is being done. Paper egg trays (filler flats) introduced in 1967 are becoming popular and this has brought down breakage of eggs during transit from 17 per cent to about 2.5 per cent.

56.3.28 Eggs are perishable and cannot be kept for more than a few days at ordinary room temperature. This has forced small farmers having a few eggs only to sell them without much delay at villages or *shandies*. In order to protect the interest of small producers, it is desirable that grading and storage facilities should be made available at all the sub-markets and main regulated markets. Since there may not be enough buyers at all these markets it is desirable to pool these eggs and transport them to markets located in urban areas for sale. Hence the existing poultry farmers' associations or co-operative marketing societies should take up this function of collecting, grading and transporting to urban areas for auctioning at the terminal markets. The Departments of Animal Husbandry in some States have set up marketing centres for eggs produced in selected areas of the States. These marketing centres in addition to sale of eggs, should also set up processing plants around the cities to dress birds. The sale centres for both eggs and dressed birds should normally be located in the terminal markets so that they could utilise the cold storage facilities available in these markets. It is desirable that only dressed birds which have been inspected by competent authority be sold in the terminal market. The Govern-

ment owned poultry processing plants in Poona and Chandigarh have made good progress since their inception in 1968. We have been informed that the plant at Poona is operating only at 20 per cent capacity. Hence this processing plant should make contractual agreement with poultry farmers' associations and owners of commercial poultry farms to have a regular supply of birds to maintain the supply of quality poultry meat and eggs. It is desirable that grading, certification and inspection is conducted at these processing plants by qualified personnel duly authorised by the State and Central Marketing Departments. The National Egg and Poultry Co-operative Marketing Federation which is likely to come up in the Fifth Plan should make funds available to the departmentally run sale centres and processing plants to purchase equipment so as to increase their activities to meet the rising demand of poultry meat and eggs.

Fish

56.3.29 Fisheries Corporations have been set up in some States to increase production and improve marketing both within and outside the country. Despite this development, the lot of the fisherman is a neglected one by and large. Fish is usually sold at the catch site itself to middlemen or traders who usually advance money to fishermen. Fishermen do not have access to information regarding prices and arrivals of fish in urban markets. Even at the terminal markets in Bombay, Calcutta and Bangalore, fish markets are controlled by middlemen and powerful groups of businessmen. Formation of Fishermen's Co-operatives should be encouraged to prevent exploitation by middlemen. These should not only act as commission agents, but should be able to buy fish on their own account and sell it later at the terminal markets to stabilize prices. Information on prices and arrivals of different varieties of fish should also be made available to fishermen for their use. Fishermen's Co-operatives should also undertake to make credit available to fishermen. Since they have no immovable property to pledge, the cooperatives have to evolve some guidelines to grant them credit. We have already dealt with the problems of marketing of fish and fishery products in detail in Chapter 40.

Minor Forest Produce

56.3.30 The marketing aspects of minor forest produce of various kinds has been dealt with appropriately in Chapter 43 on

Minor Forest Produce. We have recommended therein that the States with sizable resources of a particular minor forest product or group of products may each set up a Minor Forest Products Corporation for collecting, processing and marketing of materials. The need for an all-India organization for tackling matters connected with the export of minor forest produce, quality control, and market research has also been indicated. It has been stated therein that Agmark standards for all important items of minor forest produce should be developed and enforced. We have also expressed ourselves in favour of nationalizing trade in certain products.

4 TRANSPORT

56.4.1 Transport has its own significance in making a marketing system efficient and useful. Insofar as the means of transport are concerned, roads will continue to play the most important role even in future. Their network and maintenance is fairly satisfactory up to town level. The weakest point is below the town level *i.e.* rural roads. The length of unsurfaced roads in India was 657,933 kms in March, 1972¹ and most of these can be taken to lie in the countryside. Therefore, what is required is their reorientation. Also gaps need to be filled in order to link (a) villages with each other, (b) villages with the Sub and assembly market centres and (c) Sub and assembly market centres with the towns. This link-up and associated road development is a *sine qua non* for the success of the market structure which has been proposed for the country. All efforts in the next few Five Year Plans must be made to develop roads below the town level. Roads connecting villages could be of earthwork in order to reduce costs, with suitable lasting admixture to permit their all-season use. Roads between the primary market centres and towns could be semi-pucca built from locally available wastes of brick kilns or *kankar* or *murrām*. These suggestions regarding materials are only illustrative. In road construction there has to be a compromise between cost, durability and ease of procurement. We are of the view that the Central Road Research Institute, New Delhi should intensify research in this area, which could be adopted with advantage in different parts of the country. Insofar as the implementation part is concerned, village roads should be the responsibility of the Zilla Parishad, whereas roads between the Sub and assembly market centres and towns should be developed by the Public Works Department—all within the

1. Transport Research Division, Pocket Book of Transport in India, 1972-73 Ministry of Shipping and Transport, New Delhi, 1974. p. 106.

overall guidance and supervision of the State Government. Market Committees have to come forward to contribute from their revenues for development of these roads. The network planning should be done jointly by the Central and State Governments.

56.4.2 The modes of transport are equally important. In plains, the bullock cart still occupies a prominent place in transporting the produce from the rural areas, as indicated by the fact that the total investment in this sector including carts, bullocks and sheds is of the order of Rs. 3,000 crores as compared with Rs. 4,000 crores in railways and Rs. 1,000 crores in road transport. As per 1966 livestock census, there were 12,694 million bullock carts in the country. It is estimated that bullock carts carry nearly 60 per cent of farm produce to market and an equal amount of non-agricultural products from urban to rural areas. In addition it is estimated that nearly 20 million people are directly or indirectly employed in bullock transport. Bullock carts will continue to play an important role even in future. What is needed is their improvement. There have indeed been efforts to modernise this vehicle. Some individuals and institutions have developed two types of two wheeler bullock carts drawn by two bullocks. One type is cart made out of worn out truck axle and tyres and the other type is made out of Dunlop axle with pneumatic tyres. Both are more efficient than the conventional type. A pilot study carried out by Indian Institute of Management (IIM), Bangalore has revealed that conventional bullock cart gives a return of only 7 per cent on the capital invested as against a return of 30 per cent in the case of non-conventional two-wheeler models. The first type of cart needs only discarded axle and tyres of trucks, and modernisation process of bullock cart transportation will not impinge on the real resources of national economy. It is learnt that the IIM at Bangalore is likely to take up a detailed study of the socio-economic and technological aspects of bullock cart transportation at all-India level. This is a move in the right direction. Such studies should be conducted in cooperation with many more institutes situated in various parts of the country. There is an urgent need to redesign the conventional bullock carts to improve the technical efficiency, to increase the rate of return on capital invested and to reduce the damage to roads. The task of designing and field testing of these bullock carts could be done at the regional research-cum-testing centres set up by ICAR. The commercial banks should come forward to advance loans to farmers to purchase the improved bullock carts. These improved bullock carts would be ideal for the use of the farmers, whereas for transport between a Sub-market and

assembly market centres and towns, tractor trailers by private people and trucks by the institutionalised agencies should prove useful.

56.4.3 Boats have played a significant part in the transport system in the North-Eastern Region and Kerala. Mechanised boats have already been pressed into service but their number is small at present. It is desirable to put more reliance on mechanised boats in future. The problem is really serious in hill areas. In the absence of feeder roads, the commodities are usually carried by labourers on the back of mules to roadside points, from where these are moved by carts or trucks. Although it might appear difficult at present, when viewed in a long perspective of 25 years or more, we will be justified to visualise a situation where it could become possible to utilise helicopter cargo service or ropeways for hilly areas. Recommendations regarding development of roads in the forest areas have been made in our Interim Report on Production Forestry—Man made Forests (1972). Feasibility studies are required to be undertaken to examine as to what extent the helicopter cargo service or ropeways could be made economical. The emphasis on helicopter cargo service or providing ropeways should not be taken to mean that we are against developing road communication in such parts because service communications have their own value. Therefore, these two have to be developed in a complementary manner.

56.4.4 Railways constitute the most important artery of internal communication. An idea of the quantities of selected agricultural commodities transported through railways since 1955 could be had from Table 56.2.

TABLE 56.2
Agricultural Commodities Transported through Railways¹
(Million tonnes)

Commodity	1955-56	1960-61	1965-66	1970-71
foodgrains	9.187	12.659	14.514	15.084
jute (raw)	0.520	0.644	0.763	0.687
tea	0.262	0.250	0.203	0.245
cotton (raw)	0.751	0.536	0.485	0.376
oilseeds	1.794	1.517	1.470	1.044
sugar cane	3.463	3.237	2.717	2.780
Total	15.977	18.843	20.152	20.216

¹INDIA 1973, page 325

The overall load of the above mentioned crops could be taken to be of the order of 20 million tonnes in recent years; but when the share

of railways is examined in relation to the total all-India goods traffic, it reveals a decline of about 25 per cent over a period of two decades from 90 per cent in 1950-51 to 65 per cent in 1973-74. Apart from considerations of cost, the reasons for decline in railway traffic may be attributed to factors such as non-availability of proper type of wagons at the appropriate time, procedural delays in railway booking and deliver, longer detentions *en route*, higher percentage of pilferage and quality deterioration in transit as compared to truck transport. Hence, in order to encourage goods transport by rail so as to increase the general revenues of railways, bottlenecks such as procedural delays at the point of booking as well as delivery should be minimized. To quicken the pace of movement, detentions *en route* have to be minimized and the number of "Quick Transport Service" have to be increased. Since the quantity and pattern of movement of all agricultural commodities is likely to change, in drawing up its plans, the railway administration should take into consideration the magnitude of marketable surplus of agricultural commodities originating in several rural areas of the country, the location of processing plants to which raw commodities have to be moved and consumption points to which finished products have to be transported.

56.4.5 Transport situation is not a static one and a continuous study of the problem is necessary. Sample traffic surveys have to be conducted periodically in selected areas to show the geographic structure of marketing. Information is needed on the quantities of various commodities moved from production points to consumption centres by various modes of transport during different seasons in selected years in order to identify transportation bottlenecks, to compare the transfer costs by various modes of transport and to examine the problems constantly facing the transport industry so as to suggest improvement in the system with the sole objective of maximum utilisation of the existing transport facilities and reducing cost of transport. Traffic survey data throw light particularly on the efficiency with which the transportation functions are being performed in marketing. If there is much cross-hauling and back-hauling and if vehicles are travelling empty or only partly loaded in both directions at the same time, which are indications of wasteful use of transportation facilities, suggestions regarding better utilization could be made. There is need to conduct research to take a forward view of likely changes in the pattern of production and movement of all agriculture commodities, pattern of transport, modes of transport, costs of transportation by various means etc. Conventional transportation problems which are only two dimensional in nature could be developed

for individual commodities and solved easily by 'simplex' method* to determine the pattern of movement from surplus to deficit areas, at the lowest cost. Such a study is also useful to determine the least-cost method of transporting raw agricultural commodities from production points to consumption centres via processing plants and storage points. Several computer programmes are available for the purpose and these could be utilized in solving the generalized distribution problems.

Transport of Perishable Products

56.4.6 In view of rapidly expanding production of fresh fruits and vegetables in selected parts of the country associated with increasing demand in urban areas, it is imperative that railways should provide favourable treatment to these perishable commodities. On fruits and vegetables, which are normally of low unit value, cannot be borne the expensive freight charges of railways. There is need for rationalisation of the freight structure for fruits and vegetables. The existing 27 refrigerated rail cars are inadequate to meet the needs of the increased demand in urban areas. Efforts should be made to provide adequate number of special wagons, insulated wagons and refrigerated wagons especially for moving potatoes from Uttar Pradesh, Himachal Pradesh, Punjab and Bihar during the peak harvest season. Adequate number of wagons should be made available in those stations which usually despatch large quantities of apples, onions and grapes. Promotional programmes should be taken up by railways to popularise the use of refrigerated wagons by traders. Handling of fruits and vegetables and other perishables should be done with care, all packages should be marked with distinctive mark such as "Perishables: handle with care" and porters handling these commodities should be given higher porter charges so as to induce them to handle these packages without damage. Railways have to organise truck service for collecting these perishable commodities from markets, or roadside warehouses and arrangements have to be made to deliver the same at the terminal markets at the consumption points at nominal rates. The wagons carrying fruits and vegetables should not be attached to goods trains but should be invariably attached to mail or express trains to reduce the transit time.

56.4.7 Transportation of fruits and vegetables by trucks, though costlier than rail, is becoming popular because of the speed, economy

*Simplex method involves finding a feasible solution that satisfies restrictions and improves the solution until the total transportation cost is minimised.

and efficiency of truck transport. Special types of trucks have to be designed for carrying fruits and vegetables. To prevent deterioration in the quality of produce due to exposure at the time of detention at the inter-State checkposts, covered sheds have to be provided for stationing the trucks during detention time at checkposts on highways.

56.4.8 Fish landing is getting concentrated around fishing harbours and marketing routes are fast developing, linking the main production centres with major cities and industrial towns. At present, 9 refrigerated rail vans are in operation for transporting chilled fish from the main production centres to cities like Calcutta, Madras, Delhi, Coimbatore and Bangalore. It is reported that these facilities are used by trade when there are reliable daily services whereas weekly and bi-weekly services on some routes have not been adequately used. It has been proposed to operate 18 refrigerated rail vans during the Fifth Five Year Plan period. Most of the trucks used for transporting fish are either open or closed, uninsulated or insulated trucks. Uninsulated trucks form nearly 80 per cent of the total number of trucks used for transporting fish. It is estimated that for every tonne of fish, two tonnes of ice are needed, hence two-thirds of the space is utilised by ice only, thereby increasing the cost of transport. In view of increase in fish catches the transportation facilities for moving fish need to be expanded considerably. While refrigerated rail vans are necessary for transporting chilled fish over longer distances, a cheaper substitute namely insulated vans would be sufficient for relatively short distances. Since the cost of one broad gauge insulated van is estimated at Rs. 5 lakhs as compared to Rs. 8 lakhs of a refrigerated rail van maintaining a temperature at 0°C, and Rs. 10 lakhs of a refrigerated van maintaining a temperature at 20°C, detailed studies have to be made regarding the requirement of the type of rail vans needed from each production to marketing centre so as to make maximum use of finance available. Since carrying fish by open or uninsulated trucks results in carrying double the quantity of ice, it is desirable that use of refrigerated trucks should be popularized. The fishery cooperative marketing federations presently operating in Karnataka, Kerala, Gujarat, Orissa and West Bengal should have their own trucks to transport fish to urban centres like Calcutta, Bombay, Delhi, Madras and Bangalore.

Livestock Transport

56.4.9 Transportation of all classes of livestock is carried on either by driving the animals on hoof, trucks or rail, the method of

transportation depending upon the relative costs, convenience, distance of travel and the type of livestock. Livestock are usually transported by goods wagons when they have to be moved over long distances. In the recent past truck transport has substantially increased especially in the case of dairy cattle, sheep and goats. By both modes of transport, injuries are caused to livestock due to over-crowding, bumping and rushing during the operations of loading and unloading from trucks and rail wagons. Shrinkage is also caused during transit. The factors affecting shrinkage of livestock are time in transit and type of transportation. In one study conducted in USA it was reported that shrinkage in hogs ranged from 1.80 lbs./Cwt. to 2.42 lbs./Cwt. when the time in transit ranged from 15—19 hours to 25—29 hours. Another study based on 2,936 shipments including 1,283 shipments by rail and 1,653 by trucks, indicated that cattle moved by rail, shrink slightly more than those moved by truck. Crowding, bumping and rushing during loading, unloading and transit by rail or truck accounted for 66 per cent of the total bruises in cattle. No research has been conducted so far in this country to assess the impact of transport on the condition of livestock relating to lowering of value and physical damage. Hence there is need to undertake some research in this direction. There is also need to design goods wagons, which are equipped with roller bearings, high speed wheels, automatic brakes and bolster snubbers to reduce vibrations and bounce. The present practice of transporting cattle, sheep, goats and pigs by ordinary trucks should be discouraged. Instead special type of trucks have to be designed to prevent bruises and shrinkage during transit.

Packing of Fruits and Vegetables

56.4.10 Fruits and vegetables which are associated with high volume and weight and are juicy and tender by nature, require special attention as regards packaging, without which there could be great losses in transit. The market for any fruit or vegetable can be extended by efficient packaging techniques. Therefore, in tackling the problem of prolonging supplies over period, efficient packaging could become very useful. There is a great deal of variation in the size, shape, capacity and the material used for making containers employed for packing fruits and vegetables. Most of the conventional packaging developed on the basis of easy and economic availability of raw materials is not found suitable for the purpose. For instance, gunny bag, the most commonly used packing material is often not very efficient and could be easily substituted by bags of synthetic

origin, namely P.V.C., polythene, nylon, polyester, etc., with suitable perforation which would permit better ventilation. Palm leaf and bamboo baskets used for oranges have also been found to result in a loss of 5 to 10 per cent, as against 3 to 7 per cent in the case of wooden boxes. A stage has come when alternatives to wooden containers, so far considered to be most suitable, have to be thought of. With the expansion in production and trade of fruits and vegetables and growing demand for wood for industrial and domestic applications, the timber resources are fast depleting. Himachal Pradesh alone would be needing nearly 13 million wooden cases. These containers have become very costly and are also becoming very scarce during the season. Use of unseasoned, weak and thin planks for manufacturing containers has often caused extensive damage due to the high moisture content in the timber used. Cardboard boxes require to be popularised, particularly for fruits like apples, pears, mangoes and oranges which are despatched to long distances. There could be considerable saving in transportation costs and also saving in losses during transit. Scientific use of wrapper and padding and lining to selected high-cost fruits could be popularised. Anti-fungal tissue wrappers, cork dust, moss and lichens, paper and polythene shavings, paddy straw, wood wool, etc., could all be used with good results. In addition, standardisation of packaging also requires to be attempted progressively. This would involve the size of the container, quality and thickness of plank, ply of the cardboard, wrapping and packing material, gross and net weight, method of sealing and stencil etc. The Indian Institute of Packaging, Bombay has an important role to play in this regard. The good work already done in this Institute requires to be expanded in the years to come.

5 STORAGE

56.5.1 The present extent of storage losses in foodgrains is estimated at as much as 6 to 8 per cent and this is expected to decline to about 4 per cent by 2000 AD if efficient and adequate storage facilities are developed. Besides preventing, losses storage function, performed with technical and economic efficiency, is expected to smoothen the availability of produce over different periods of the year and over several years, and also act as a cushion against intra-seasonal price fluctuations and inter-seasonal variations. Commodities have to be stored at farm level before marketing at market level, at processing plants and at the level of wholesale and retail trading. Farmers usually store only foodgrains for purposes such as consump-

tion, seed for sowing, payment in kind to labourers and also some quantities for sale at a later date. Majority of the farmers do not store commercial crops such as cotton, jute, tobacco, oilseeds and they usually dispose them of as early as possible for want of immediate cash, only large farmers hold them for sometime with the object of getting higher prices. Producers of fruit, vegetables, livestock products and fish sell the produce immediately since they are perishable and need cold storage facilities, which they cannot afford. The essential features of storage at the producer's level and storage for commercial purposes are discussed in this Section

Farm Level Storage

56.5.2 Majority of farmers store their produce either in bulk or in hessian bags. The produce is usually stored in dwelling houses in tin drums, specially improvised big earthenware, *pucca kothas*, underground mud-walled or concretised cellars and RCC bins. The first step in the direction of providing improved storage structures to farmers was made by the Grain Storage Research and Training Institute (GSR&TI) (which was established at Hapur in 1958) in evolving cheap and durable metal bin structures. The Institute designed and fabricated indoor metal bins of 0.6, 1.0, 2.0 and outdoor metal bins of 4, 9, and 10.50 tonnes capacities. The Indian Agricultural Research Institute at New Delhi developed a cheap storage structure called "pusa bin" which is a square structure made of two layers of unburnt bricks, in between which a polythene film is wedged making the structure gas and moisture proof. A modified "pusa bin" was developed by the University of Agricultural Sciences, Bangalore. These two structures are comparatively cheaper than the metal and RCC bins developed at Hapur. The Indian Standards Institute has laid down standards for some of the metal bins developed at Hapur Institute. To popularise the use of metal bins among farmers, a scheme was initiated by the Government of Punjab to sell 500 metal bins of 0.7 tonne capacity. In 1971, the Government of India, under the "Save Grain Campaign" initiated a project of Rs. 40 lakhs for supplying metal bins to farmers on credit basis payable in three instalments, in the five States of Bihar, Haryana, Punjab, Madhya Pradesh and Uttar Pradesh. Another Rs. 64 lakhs was expected to be allotted to other States during the latter half of the Fourth Five Year Plan to extend the same benefit to farmers. With the assistance from the United Kingdom "Freedom From Hunger Campaign Committees", a project for improvement of farmers storage facilities was taken up in four villages in Andhra Pradesh. Under

this project, 200 storage structures of 0.5 to 2.0 tonnes capacity were supplied to farmers. In 1968, Pesticides Association of India donated 20 metal bins of 6 tonnes capacity to farmers in villages in Uttar Pradesh and 9 bins in Kosi development area in Bihar. All these measures have not touched even a fringe of the problem. A massive campaign has to be undertaken to provide all needy farmers with improved storage structures at reasonable cost. It will not be possible for the Governments to involve themselves in this task directly. The task of financing and supplying these structures is also beyond the capacity of cooperative societies. This could be taken up by the state agro-industries corporations. They should manufacture the improved storage structures as per ISI specifications and also arrange to sell these to farmers. There is no dearth of different designs of improved structures suitable for farmers' Storage, but there is need to reduce cost through the use of locally available material. Since temperature is an important factor in controlling moisture or disease-pest menace it is advisable to make the walls of storage structures from a material with low thermal conductivity. Some research in this direction is already being conducted at the University of Agricultural Sciences, Bangalore, Indian Agricultural Research Institute, New Delhi and Punjab Agricultural University at Ludhiana. Work on these lines has to be undertaken in all the States and the Agro-Industries Corporations have to make full use of it in their programmes of manufacture.

Losses

56.5.3. Commodities under storage conditions suffer damage mainly from three sources viz. insects, rodents and micro-organisms. Safety of stored commodities from damage by insects & micro-organisms, depends to a large extent on the proper management of three factors, namely, moisture content, proper containers and development of temperature gradient. Loss in storage of foodgrains can be broadly classified as loss in weight and loss in quality. A study by the Grain Storage Research and Training Institute at Hapur found that after a storage period of nearly 2, 5, 8 and 12 months, the losses in wheat on an average were 0.27 per cent, 1.31 per cent, 4.12 per cent and 7.0 per cent respectively.¹ Another study on storage of wheat in villages in Uttar Pradesh regarding damage caused by insects only showed that quantitative insect damage ranged from

¹. 1971. Report, Expert Committee on Storage; p. 120, New Delhi, Planning Commission, Government of India.

2.0 per cent for metal drums to 7.6 per cent for *kuthla* and 9.5 per cent for *katcha kothi*. About 40 insect pests are known to attack agricultural commodities in storage, of which about 12 prefer food-grains only. The damage by these is aggravated by high moisture content in the grain. The important storage pests are rice weevil, beetle pest, *khapra* beetle, grain moth and the pulse beetles. The rodents most destructive of stored foodgrain in the country are the brown rat, black rat, Indian mole rat and the house mouse. Micro-organisms include moulds, yeasts and bacteria. They live off stored grain and thrive best under warm moist conditions particularly in broken grains. It is estimated that out of a total loss in storage amounting to 6.2 per cent, 2.55 per cent is attributed to insects, 2.50 per cent to rodents and the remainder to birds and moisture.

56.5.4 Till about two decades back, godown sanitation and hygiene were the only known methods of minimizing losses and it was practiced indifferently. To educate the farmers in better methods of storage, the government initiated 'Save Grain Campaign' in 1965-66, with the object of popularising scientific techniques of storage by organising publicity and demonstrations in villages and also by conducting training classes. Practical demonstration is a feature of the campaign. Literature on different techniques of storage and preservation is being supplied free of cost. At the end of Fourth Plan, there were six centres located at different parts of the country under this Campaign to conduct training, extension and demonstration to farmers in surrounding villages. The effort towards training farmers and conducting demonstrations is limited to very few villages around these six centres. It will not be possible for "Save Grain Campaign" to cover all the half million villages and with its present set up this will not have much impact on farmers. But the Government cannot neglect this activity in view of the enormous loss of produce in storage at farmer's level. It is desirable to train the existing staff at block level to conduct demonstration and training of farmers in the method of scientific storage and pest control. Necessary financial assistance should be provided to agencies at the block level.

56.5.5 Loss in storage due to rodents forms a major constituent, as discussed above. It is estimated that six rats consume as much foodgrains as a man, and what they do not eat they contaminate with excreta, making the grain unfit for human consumption. The loss through contamination is estimated at 10 times more than their consumption. Rodenticides and fumigants should be used for the control of loss in storage due to rodents and insect pests.

56.5.6 By keeping moisture content in the grain below 8 per cent most of the insect infestation can be avoided. Hence if the grain

is dried up to about 8 per cent moisture content and then kept in a reasonably air tight container, most of the species will not multiply and those that multiply will get annihilated due to shortage of oxygen. In case of bag storage, the bags have to be either dipped in solutions of Malathion or pyrethrum or benzene hexachloride and dried before use. Handling of fumigants some of which are toxic and require special appliance may be beyond the capacity of many farmers; hence the work of fumigation has to be done by trained personnel only. The Gramsevak or Agricultural Extension Officers may be trained. Potent pesticides, like DDT, BHC and Malathion should not be used in case of grains meant for human consumption. We have dealt with this question fully in Chapter 49 on Plant Protection Chemicals.

56.5.7. Micro-organisms thrive best under warm, moist conditions particularly in broken grains. They become active only when moisture content is high and temperature is favourable for their development. Discolouration in appearance and bad smell produced in grain during storage are results of the activity of micro-organisms. Damage by micro-organisms is prevented by keeping the grains dry and cool. Farmers storing grains in bulk have to keep the moisture content as low as 8 per cent and when there are signs of discolouration or bad smell, they have to take out the grains and cool them to prevent damage. Regarding grains stored in bags, protection from ground moisture by stacking bags over some dunnage like wooden crates and polythene sheets is needed. The grain bags should be properly stocked away from walls as far as possible.

56.5.8 In view of the fact that nearly 60 to 70 per cent of food-grains produced is retained by farmers, an accurate assessment of the nature and extent of losses, during storage and handling in the country is essential. Department of Food, Ministry of Agriculture and Irrigation appointed a Committee in 1966 to make an assessment of this loss and the Committee submitted its Interim Report in 1971. There it observed that data collected through surveys were meagre and they could not be used for making an overall estimate of food-grains losses in the country. It is proposed to initiate an all-India coordinated programme of research on grain storage and apex level training at Hapur as headquarters and sub-stations at certain selected institutes during the Fifth Plan. Very little study has been carried out to estimate the quantitative and qualitative losses in storage at the farm level. There is need for conducting a survey on a wider scale especially in Intensive Agricultural District Programme (IADP) areas to estimate the losses and identify the constraints faced by the farmers in storing produce. The above all-India programme of research and training should be suitably modified and an All-India

coordinated research programme on post-harvest technology and farm level storage should be instituted under the ICAR. The main unit could continue to be located at Iapur and research units should be established at agricultural universities.

Commercial Storage

56.5.9 Till about 1955, commercial storage *i.e.*, storage of marketed produce was done by traders and processors. On the recommendations of the All-India Rural Credit Survey Committee (1954), Agricultural Produce Development and Warehousing Corporation Act was passed in 1956. The Central Warehousing Corporation (CWC) was set up in 1957 to construct and operate warehouses. As subsidiaries to CWC, State Warehousing Corporations (SWC) have also been established in 15 States. The FCI which was established in 1965 has its own warehouses. The owned storage capacity with FCI, CWC, SWC and State Governments was 6.04 million tonnes on 1-4-1971 and the total capacity likely to be available with these agencies by the end of 1973-74 was expected to be about 9.1 million tonnes.¹ Then there are many storages with the cooperative societies. The facilities of FCI warehouses are meant only for their use, whereas the facilities of CWC, SWC and cooperatives are meant for traders, producers, the FCI and the State Civil Supplies Departments. Traders are making maximum use of the facilities of CWC. As on 31st December, 1970, 71 per cent of the storage capacity was utilised by traders, 23 per cent by cooperatives and only 6 per cent by producers. Regarding SWC facilities, Government utilised 72 per cent of the accommodation followed by traders (22 per cent), cooperatives (5 per cent) and producers (1 per cent). The FCI and the State Government Warehouses store mostly foodgrains, whereas CWC, SWC and cooperatives store as many as 120 agricultural commodities, fertilizers, pesticides and agricultural implements. At present nearly 75 per cent of the storage capacity of cooperatives is being utilised for fertilisers. The present practice of permitting storage of foodgrains along with other agricultural commodities, fertilisers, pesticides and implements is not a sound practice. It is desirable to store fertilisers and pesticides at least in separate compartments if no separate accommodation is available. As far as possible fertilisers, pesticides and other inputs which are needed in production areas should be stored in rural godowns operated by the cooperatives.

¹1971. Report of the Expert Committee on Storage, Annexure II, New Delhi, Planning Commission, Govt. of India

56.5.10 Special endeavours will now have to be made to construct storages in rural areas, i.e., at each of the assembly or sub-market centres, suitably linking them with the storage facilities at the wholesale and terminal markets. The object should be to make provision for the storage of 50 per cent of the marketable surplus of foodgrains at the primary centres. These very godowns could prove useful for other commodities too. Planning has also to be done for building necessary storage capacity at the level other than the market centres in order to cope up with the increasing production and demands for various purposes. The policy of the Government has been to distribute foodgrains to the urban consumers through fair price shops. We have recommended in our Interim Report on Agricultural Price Policy that the public distribution system should normally cover (a) all cities and towns with population over one lakh, excluding those in surplus areas in surplus States; (b) all industrial towns covered under the scheme of All-India Consumer price index numbers for industrial workers, and (c) drought prone and flood affected areas. Further, the modified rationing system, which is working in rural and urban areas of Jammu & Kashmir and Kerala may also have to be continued for some time. Hence there is need to increase the existing storage capacity with FCI and other agencies to store foodgrains alone by 2000 AD if it has to fulfil its objective of maintaining the distribution of foodgrains under the public distribution system without depending upon private agencies. In the years to come, production of foodgrains would increase substantially, thereby increasing the marketable surplus. There is need for substantial increase in the storage capacity both in production and consumption areas. Though traders are expected to maintain their own godowns and producers are likely to hold their produce for some time, it is desirable that CWC, SWC and cooperatives, increase their storage capacity to store at least 50 per cent of marketable surplus.

Cotton

56.5.11 Cotton has to be processed before it is used and requires storage facilities at several stages. Generally storage function is performed by growers, traders, ginning and pressing factories and mills. Produce from small agricultural holdings, is not large enough for storage. Majority of producers sell it in the regulated market as early as possible. In view of the short time during which *kapas* is stored, it is not economical for them to maintain *pucca* storage structures. At the primary markets, cotton is usually kept in open yard or sometimes on platforms covered with tarpaulin sheets. The

godowns are owned either by cooperative societies or traders. Raw cotton has to be stored in the ginning factories for sometime. Here cotton is exposed to such risks as excessive heat and occasional showers. Ginning factories have some storage facilities, which are inadequate. At present there are about 3,300 ginning and pressing factories in the country. Storage facilities have to be improved and expanded at these locations both for *kapas* and ginned cotton. Provision of adequate and simple storage structures has to be taken up at the new ginning and pressing factories likely to be established in the new areas of cultivation of cotton. After ginning and pressing, the hazard of damage from sun or rain storm is minimized. The problem at this point is mostly for raw cotton in transit. The storage capacity at the regulated markets is wholly inadequate and the cotton is stored generally in open yards. Simple type of structure with a cover at the top and some sort of *pucca* platform is enough at the market yards, since the produce is retained here for a short time. In view of increased production, and concentration of three-fourths of market arrivals in about six months, storage facilities have to be expanded at the selected regulated markets in traditionally cotton growing areas in the States of Maharashtra, Gujarat, Karnataka, Punjab, Haryana, Andhra Pradesh and Tamilnadu. Storage facilities have also to be provided as quickly as possible at the regulated markets in new areas coming up under cotton cultivation such as canal area in Rajasthan, command areas of Tunga Bhadra project in Karnataka and Nagarjunasagar project in Andhra Pradesh. The number of farmers disposing of their produce through PCMS has been on the increase in the recent years. Hence to safeguard the interests of producers from fall in prices immediately after harvest, it is desirable that the PCMS should have adequate number of warehouses to store cotton for some time. Their storage capacity should be at least 25 to 30 per cent of arrivals in peak season in the markets. Secondly, the State Warehousing Corporations have to provide warehousing facilities for needy farmers so that those farmers, who desire to sell the produce at a later date, could get loan from the commercial banks by pledging their warehouse receipts. The Cotton Corporation of India could come forward to help PCMS as well as CWC and SWC in this field. Instead of making outright purchases when prices fall, they could advance money to growers on the warehouse receipt issued by cooperatives and warehousing Corporations to the extent of 50 to 75 per cent of the value of the produce depending upon their financial position. By this action, the arrivals at the regulated markets could be controlled, as one of the measures of preventing sudden fall in prices.

Jute

56.5.12 Storage of jute is done at various levels namely farmer, secondary markets and mills. Jute is purchased from small farmers immediately after harvest by small traders, who act as agents of mills or merchants and is moved to secondary markets, where some sort of grading is done and despatched to mills at Calcutta. Normally farmers growing jute do not store fibre. Lack of storage facilities and need for immediate cash are the factors forcing them to sell immediately after it is ready for sale. The fibre is stored in secondary markets for some time. Surveys have shown that storage in these secondary markets is quite satisfactory. The godowns are owned by private traders, which results in exploitation. Though legislation has been enacted in three out of four States to regulate marketing of jute, it has yet to be introduced in West Bengal and enforcement has not been effective in the States of Bihar and Orissa. The role of co-operatives has been insignificant in jute marketing in these jute growing states, which has to be developed. It should follow the same general provide the necessary storage facilities to growers at the assembly and the primary market centres to the terminal markets. They have to provide the necessary storage facilities to growers at the assembly and wholesale market centres. The possibility of Jute Corporation of India advancing money to growers who store their jute in the warehouses operated by the PCMS, CWC and SWC on the basis of warehouse receipts needs examination. This would regulate the arrivals in the market and help in stabilizing prices of jute.

Cold Storage

56.5.13 In the preservation of fruits, vegetables, meat and meat products, fish, milk and milk products a network of cold storages are needed as an adjunct to marketing and processing of perishable commodities. Cold storage industry started late and the growth has been very slow. In 1960 there were 359 units with an installed capacity of 305,000 tonnes. At the end of 1973, there were 1500 units with an installed capacity of 1.868 million tonnes. Cold storage facilities are not located uniformly all over the country. They are concentrated in the four States of Uttar Pradesh, Bihar, West Bengal and Punjab, constituting about 80 per cent of the total storage capacity. At present, nearly 84 per cent of units holding nearly 94 per cent of installed capacity is in the private sector. The owners of these cold storages corner maximum storage capacity for themselves and also

raise rental charges in times of abundance with the objectives of forcing the primary producers to dispose of their produce. By this means they earn huge profits in view of high price differential between peak and lean periods for most of the perishables especially potatoes, apples and oranges. Proposal under the Cold Storage Order 1964, to earmark a certain percentage of space for primary producers in addition to fixing maximum rental charges for different varieties of products needs careful consideration. Another way to prevent malpractices of private owners is to increase the cold storage facilities at the production centres and terminal markets in the cooperative or public sector.

56.5.14 A commodity-wise usage position as in 1972 of the cold storage facility is presented in Table 56.3.¹

TABLE 56.3
Availability of Cold Storage Capacity

Commodity	Number of units	Capacity tonnes
potatoes	919	1,596,961
fruit & vegetables	76	61,833
fish, meat, eggs poultry	193	4,802
milk, butter & dairy products	82	19,273
multipurpose	110	81,142
other items	23	321

It is seen that most of the existing cold storage facility caters to potato only. But with expansion and location of cold storages in markets located both in production areas, and consumption centres, it would be possible to meet the requirement of all perishable commodities.

56.5.15 With regard to the planning of future storages for agricultural commodities, it should be agreed that the network should be as wide as possible and should cater to the needs of all commodities. The storages, whether ordinary or air conditioned, must exist at all the assembly or sub-market centres, wholesale markets and *mandis* or

¹ 1974, August, The Cold Storage Industry India. Directorate of Marketing & Inspection New Delhi, Govt. of India.

terminal points. Their capacity and constructional details may depend upon the type of the market, the commodities involved and the extent of turnover. For cold storages, some cheaper models have to be thought of for the assembly market level. Markets meant specially for fruit, vegetable, meat and fish must have the best cold storage arrangements. Insofar as the responsibility for constructional arrangements is concerned, it has to be recognised that the Civil Supplies Departments, FCI, CWC, SWC and co-operatives are at present operating warehouses in the country and, therefore, it is better in the interest of maintaining coordination and optimum utilization of capacity that the construction of warehouses by all these agencies is taken up in a coordinated manner so as to avoid duplication and waste of a scarce resource like finance. It is desirable that FCI concentrates its activities in the construction of silos and flat type warehouses, needed for foodgrains under public distribution system and buffer stock in the first instance. CWC should operate the warehouses to store foodgrains needed for public distribution system on priority basis and later for storing the commodities of producers and traders. SWC and co-operatives should operate warehouses at regulated markets, assembly and sub-markets to store not only foodgrains but also other commodities and agricultural inputs. In order to coordinate the activities of these agencies in construction and operation of warehouses, a coordinating committee may be set up in each State. In the matter of construction and operation of cold storages, it has already been stated above that private ownership has to be discouraged in future and cold storages have to be set up both in the cooperative and public sector.

6 MARKETING EDUCATION, RESEARCH, EXTENSION AND ADMINISTRATION

56.6.1 The division of agricultural economics in agricultural universities teaches the subject of agricultural marketing as a part of general syllabus at the graduate level but the course is elementary. There is need for specialisation in the areas of agricultural marketing and cooperation at the graduate level itself. In view of the fact that all markets will be brought under regulation, it is desirable that persons with a Degree in Agricultural Marketing are employed in these markets. At present, there is no provision for a Degree in Agricultural Marketing in any of the agricultural universities. Hence, it is desirable that such Degree courses are instituted at all the agricultural universities. There is provision even now for specialisation in agricultural marketing at the postgraduate levels of M.Sc. and Ph.D.

Therefore, there will not be dearth of qualified people in the field of agricultural marketing. However, to make them fit for taking up administrative posts, it is desirable that the specialists should have training in marketing management also.

Training

56.6.2 A training programme for supervisory marketing personnel, which was started in 1956 by the Directorate of Marketing and Inspection, was the first attempt to provide training facilities in this field. Since then, there has been considerable improvement as regards availability of training facilities within the country in the field of agricultural marketing both in terms of quality and quantity. The present position regarding training facilities is indicated below:

I Facilities provided by the Directorate of Marketing & Inspection.

- (i) **Diploma Course in Agricultural Marketing:** Organised first in the year 1956-57, this course specially caters to the senior personnel of the marketing organisations in the different States. The curriculum includes advanced instruction in marketing theory and techniques and the candidates are required to carry out a marketing survey. The programme seeks to mould the trainees into general-purpose marketing men who could efficiently put through the various development programmes. Successful candidates were formerly given a certificate but since 1966-67, they get a diploma. A degree in certain disciplines is the minimum qualification prescribed for admission to the course. A stipend of Rs. 120 per month is given to the trainees.
- (ii) **Training for Market Secretaries:** Started in 1957, this course is oriented to equip personnel to administer the regulated markets more efficiently. The duration of the course was initially five months, since reduced to 4 months. Training is simultaneously given at 3 centres (presently at Hyderabad, Lucknow and Chandigarh), each centre having a capacity to admit 30 students. Most of the candidates are sponsored by the State Governments and the market Committees. The syllabus for the training includes a study in depth of the provisions of the Agricultural Produce, Markets Act, Rules and Bye-laws of the different States and also the manner of their en-

forcement. A stipend of Rs. 80 per month is given to the trainees.

- (iii) Training of Grading Supervisors: Under this programme, training is imparted to the supervisory staff in charge of commercial grading centres. The course includes lectures on principles and functions of marketing, sampling techniques, methods of analysis of different commodities, methods of sale etc. Practicals involving analysis of samples of different agricultural produce are also included. Stipend of Rs. 80 per month is given to the candidates.
- (iv) Training course in marketing of livestock and livestock products: Started in 1955, this is a specialised course imparting training in marketing of livestock and livestock products. Officers from the Animal Husbandry/Veterinary Departments of the States are sponsored for this programme. The duration of the course is six months. Up to 1971 this was a certificate course but this has since been converted into a diploma course.
- (v) Training course for Graders and Assessors: Started in 1962, this was originally a combined course for graders, assessors and supervisors, the duration being 3 months. Because of the difficulty faced by the trainees in comprehending the instructions taught in English, from 1970 onwards the programme was decentralised and training courses for the graders are now organised in the States, the teaching being in the regional language. A monthly stipend of Rs. 80/- is given to the candidates. Presently, four such centres are being run.
- (vi) Training in grading of special commodities: Grading of tobacco: A six months training programme started in 1968, which provides intensive practical training in grading of tobacco to the farmers before the same is sold. Most of these candidates have been sponsored by the State Governments and Marketing Cooperatives. Grading of cotton: The cotton Classing Centre at Surat offers an intensive training programme in methods of evaluating cotton by visual as well as laboratory testing methods. The course is of 4 months duration and a stipend of Rs. 120 per month is paid to the candidates. The DMI also organises a number of *ad hoc* short-term programmes for imparting training in grading of *kapas*

Grading of jute: *Ad hoc* training courses of 3 months duration in grading of raw jute are organised from time to time depending on the demand. The trainees are mostly from the State Marketing Departments and jute marketing co-operatives.

Cleaning and Processing of Animal Casings: A short duration programme lasting 4 weeks, imparts training in improved methods of cleaning and processing of animal casings.

- (vii) Other courses run by DMI: In addition to the training programmes mentioned above, the DMI makes arrangements for training science graduates in the analysis of *ghee*, vegetable oils, butter, spices, honey etc. at the Central Agmark Laboratory at Nagpur or Regional Agmark Laboratories of the DMI. Candidates are sponsored by the State Governments, cooperatives and individual authorised packers. After receiving training, they are usually employed as grading chemists.

II. Facilities provided by the States

- (viii) During recent years, some of the State Governments have also taken measures to organise training facilities in the field of agricultural marketing in their respective States. The State of Karnataka was the first to initiate concrete action in this connection. The Karnataka Regulated Markets Advisory Committee was instrumental for the setting up of the Agricultural Marketing Training Centre at Hubli in 1953. Initially, *ad hoc* short term training courses in agricultural marketing were being provided at this centre from 1953 to 1963. From, 1964, this centre is providing a three months' certificate course. From 1971 onwards, a junior diploma course in agricultural marketing which has been recognised by the Government of Karnataka, is also being offered. In addition, the graders' training course is also being organised by this training centre under the decentralised programme of the DMI. More recently, a Marketing Training College sponsored by the Karnataka State Agricultural Marketing Board has been set up at Mysore for imparting training to the secretaries of market committees, officers of marketing departments, chairmen, vice-chairmen and members of market committees and market functionaries. The Government of Uttar

Pradesh has also set up a Market Training Institute at Lucknow which organises the 3 months training course for graders under the decentralised plan of the DMI. Short-term refresher courses in the areas of market intelligence, grading, marketing extension etc. are also provided by this Institute from time to time for the benefit of the field staff of the State Agricultural Marketing Section.

III. Facilities provided by other Institutions/Agencies

- (ix) Of late, other institutions like the Indian Institute of Foreign Trade and Indian Institutes of Management have also been offering several training programmes in the field of agricultural marketing. These programmes, which generally cater to the middle and senior level personnel, are of specialised nature and cover specific areas of marketing such as market research, export marketing, agri-business techniques etc.

To prevent proliferation of training facilities and avoid duplication of efforts, it would be desirable to clearly demarcate the responsibility of the Centre and the State Governments in the field of training. The DMI should continue to offer the Diploma Course in Agricultural Marketing, training course for secretaries of the Regulated Markets, Grading Supervisors' Training Course and Training Course for Chemists to man the Agmark Laboratories. Regarding training courses for Graders and Assessors and specialised training courses for grading tobacco, jute and cotton, these should be conducted by the State Marketing Departments.

Market Research

56.6.3 Agricultural marketing system must grow simultaneously with commercialization in agriculture, otherwise it may become an obstacle to economic development. Hence research studies related to marketing are essential. Research in agricultural marketing could be classified into two main categories, viz.

- (i) problems concerned with physical marketing functions which include assembly, storage, grading, processing and transportation;
- (ii) intangible functions stemming from the transfer of ownership that includes pricing, risk bearing and financing.

56.6.4 Ever since its inception DMI has been conducting

surveys and publishing reports covering major aspects of commodity marketing. So far 40 such reports have been published. In addition 186 publications relating to marketing functions and institutions have been released by DMI. A survey of regulated markets initiated in 1970 is still under progress. These programmes are implemented by DMI, through its 4 regional offices, 7 sub-regional offices and a large number of sub-offices spread all over the country. Apart from DMI, other agencies such as Directorate of Economics and Statistics, Institute of Agricultural Research Statistics, National Co-operative Development Corporation and agricultural universities in Punjab and Karnataka have carried out a number of studies on marketing problems mostly of a local or regional nature. Marketing Department of Karnataka, West Bengal and Maharashtra have completed a series of surveys relating to marketing of agricultural commodities of importance in the concerned State. Market research relating to specialized areas like export potential, export marketing and feasibility studies concerning food processing are being carried on by Indian Institute of Foreign Trade, Indian Institute of Packaging and Indian Institute of Management. In addition a private sector organization viz., the Institute of Marketing and Management has undertaken some market research studies.

56.6.5 The marketing surveys and publications of DMI describe the types of markets, role of market functionaries, and participants and marketing problems regarding a number of agricultural commodities. Market research conducted by other agencies also relate to specific commodities only. Research studies in the following areas are also referred to be undertaken: (a) determining the various factors causing price variations in alternative markets and their relation to transfer costs in particular region; (b) importance of level of knowledge as they affect structure, conduct and performance of markets; (c) comparative efficiencies of various institutions performing marketing functions; (d) most suitable location and lay-out, including the type of physical facilities, size of the market and the major function and services to be performed at these markets. Market research cannot be conducted in isolation and any agency entrusted with conducting research in marketing needs the active cooperation of ICAR, DES, DMI, Agricultural Prices Commission, Commodity Corporations, Railways and Transport Ministries at the Central level and Departments of Agriculture, Animal Husbandry, Horticulture and Fisheries at State level depending upon the problem selected for study. Hence there is need to initiate a research programme on a coordinated all-India basis to tackle problems of

marketing. We recommend that an All-India Coordinated Research Programme on Agricultural Marketing may be initiated under the aegis of the ICAR on the lines of existing All-India Coordinated Research Projects. The surveys currently conducted by the DMI are mostly commodity-oriented. It is necessary that the DMI should undertake surveys to update the existing marketing survey reports and also to carry out surveys which are problem-oriented in nature. The State Marketing Departments should continue to conduct localised marketing surveys at the micro-level and also provide the DMI the required support for all-India Survey. The other agencies could continue to do market research as related to their specific commodities.

Marketing Extension

56.6.6 The object of marketing extension is to apprise producers, traders and consumers of various voluntary and regulatory measures brought into force for the improvement of the marketing system so that they can all derive the benefits flowing from these measures. Acceptance of any newly evolved marketing technique relating to preparation of the produce, packaging, grading and the control of quality, handling and storage etc. by the farmers or traders invariably requires a great deal of persuasion to convince them about the advantages of adopting those techniques. It is here that practical demonstration of such improved techniques has immense usefulness. An Extension Cell exists in the DMI, but its counterparts do not exist in most of the States. This lacuna requires to be removed for establishing a well-knit service throughout the country. Marketing extension work, particularly as directed to the large number of farmers in the rural areas, makes a heavy demand on manpower and resources. Methods will have to be found for extending extension programmes to cover agricultural marketing without adding greatly to their cost. For instance, marketing organisations could take advantage of the farmers' training programmes for extension work relating to marketing. Regulated markets, PCMS and FSS which have been helping in the orderly marketing of farm produce could also become a powerful medium for undertaking agricultural marketing extension work. It should be the responsibility of the Central and State Marketing Organisations to first grasp the implications of new research data, new commercial techniques and new economic conditions of the farmers and traders and then to prepare advisory booklets, circulars, talks, hold 'Agmark'

exhibitions etc., transmitting the technical information into simple, understandable language which could be passed on to regulated markets, PCMS and FSS so that these could arrange for their further distribution.

Agricultural Marketing Administration

56.6.7 The DMI was set up by the Government of India in 1935 on the recommendations of the Royal Commission on Agriculture (1928) to function as the agency to implement the marketing policies at the Centre. The administrative structure for implementing agricultural marketing policies at the State level varies considerably from State to State both as regards the extent of autonomy enjoyed as well as the relative status of the marketing division *vis-a-vis* the agencies responsible for agricultural production. On the one hand, there is the completely independent Directorate of Agricultural Marketing as in Andhra Pradesh and Maharashtra (the latter not yet having full-fledged independent staff) and on the other hand is the arrangement of entrusting all work relating to agricultural marketing to a small section forming part of the Directorate of Agriculture as in the States of Kerala, Madhya Pradesh, Rajasthan, Assam, etc. In between these two categories, there are States like Karnataka and West Bengal, where agricultural marketing is handled by an autonomous section which, however, functions under a department—either Cooperation or Agriculture. In Karnataka, for instance, agricultural marketing is with the Department of Cooperation and the Registrar of Cooperative Societies is also designated the Chief Marketing Officer. However, the Additional Chief Marketing Officer under him, heads the Marketing Section which has its own identity, a separate cadre and has considerable degree of freedom of action in its own field of activity. In West Bengal, Agricultural Marketing, although a part of the Department of Agriculture, is headed by an Additional Director of Agriculture (Marketing). The Marketing Section has its own identity and cadre which gives the section sufficient scope to operate. At the level of the State Secretariat again, the subject of agricultural marketing is dealt with either under the Department of Agriculture or under that of Cooperation. At the State level also, decisions relating to agricultural marketing are influenced by the Food Department, Civil Supplies Department, State Warehousing Corporations, State Marketing Boards and a host of similar organisations/agencies.

56.6.8 The first need is to create a uniform structure in all

the States. There should be a full-fledged Directorate of Agricultural Marketing in the Department of Agriculture in every State. The administrative structure has to be built up right up to the divisional, district and taluk level for implementing marketing policies. Without this build up, it will be practically impossible to ensure that the programmes received the attention, supervision and direction that they will require. At the Centre, there is likely to be considerable increase in the activities of the DMI. The Agricultural Marketing Adviser to the Government of India should be enabled to 'advise' the Government more effectively as regards agricultural marketing policies. Towards this end, the status of the Agricultural Marketing Adviser should be elevated commensurate with his manifold responsibilities. He should be given ex-officio status of a Joint Secretary so that it would facilitate his putting forth his ideas and proposals more effectively before the Department of Rural Development in the Ministry of Agriculture and Irrigation. In view of the increased responsibilities entrusted to DMI, particularly in the areas of market regulation and supervision, grading and inspection as indicated in the preceding paragraphs, it is desirable to strengthen the administrative machinery of the DMI on the following lines. The DMI should be divided into four units, each headed by an officer of the rank of Joint Agricultural Marketing Adviser. The four units and their functions could be:—

- (i) Grading, standardization, inspection and certification: to formulate grades and standards, to inspect all commodities (raw and processed) meant for inter-state and export trade, to collect samples of produce for analysis at central and regional Agmark laboratories and to administer central and regional "Agmark" laboratories.
- (ii) Market surveys, co-ordination and extension: to conduct market surveys, to perform extension activities and to co-ordinate with other Government agencies performing marketing functions.
- (iii) Training, planning and development: to look after in-service training of market secretaries, grading supervisors and chemists, to conduct workshops and seminars for members of regulated market committee and officials of state marketing departments and to guide and assist state marketing departments in developmental activities.
- (iv) Supervision and Regulation: to supervise and regulate trading practices of those functionaries engaged in inter-state and export trade, to prevent monopoly practices

by traders and processors engaged in inter-state and export trade; to frame and supervise marketing agreements and market orders. Each unit should be assisted by adequate supporting staff.

56.6.9 Marketing boards were established in several States to supervise, control and coordinate the activities of the markets brought under regulation. The marketing departments which have been a part of the Directorate of Agriculture or of Cooperation have been supervising and controlling the market committees. Need was felt to create an apex body to lay down policies and take up development of regulated markets in a phased manner. Such apex bodies were initially set up in Punjab and Haryana. Later, the States of Karnataka, Andhra Pradesh, Bihar, Rajasthan, Tamil Nadu and Uttar Pradesh established the marketing boards in their States to provide for a unified policy formulation machinery and to look after the development of markets. The constitution, powers and functions of these boards vary from State to State. Some marketing boards have a minister or a non-official as chairman and the State Marketing Officer as Secretary. In a few States there is a wholetime Secretary. Regarding the powers of the boards in some States it is purely an advisory body whereas in some others it is an executive body with financial and administrative control over the market committees. All the functions of the marketing department along with the staff have been transferred to the board in Bihar. Marketing boards in all States look after research, extension and training. Opinion is crystallising towards transferring all the work relating to marketing to these boards. We recommend that Agricultural Marketing Boards should be set up in States where they have not yet been set up. There is need for ensuring broad uniformity in the composition and functions of these boards. The constitution of the board should have provisions that will enable it to function independently without any interference from outside. The chairman of the board should normally be the Minister in charge of agricultural marketing. The board should have Directors of Agriculture, Horticulture, Animal Husbandry and Fisheries as official members. The non-official members should be elected from among the chairmen of the market committees. The State level Agricultural Marketing Officer should be the member-secretary. The board should have both advisory and policy functions. The more important functions are:—

- (i) to supervise the activities of market committees;
- (ii) to formulate grade standards;

- (iii) to conduct research and training in agricultural marketing on its own and also to sponsor such activities through other institutions;
- (iv) to consider location of new markets;
- (v) to take up all aspects of development of markets;
- (vi) to consider granting loans or subsidies to financially weak markets;
- (vii) to prescribe the licence fees to market functionaries, market fees and also to formulate procedures for granting licences to market functionaries; and
- (viii) to advise the Government on any policy matter in the field of agricultural marketing referred to it.

56.6.10 Besides the governmental responsibilities inherent in the above mentioned administrative arrangements involving the DMI and the proposed State Agricultural Marketing Departments, an important role for the Central as well as State Governments will be to initiate policies in order to integrate the activities of cooperative marketing societies, processing cooperatives and consumer cooperatives so as to strengthen the cooperative sector and thus provide an effective alternative to the private sector organisation. In 1958, an organization called National Agricultural Cooperative Marketing Federation Ltd. (NAFED) was established at the Centre, to co-ordinate the activities of the State Marketing Federations and also to render advice and technical guidance to these societies. This organisation has also been undertaking export and inter-state trade of some agricultural commodities. An organization called National Cooperative Development Corporation (NCDC) was set up in 1963, to finance and coordinate the activities of cooperative institutions. Its main functions are to plan and promote programmes for production, processing, marketing, storage and advance loans and/or grant subsidies for financing the cooperative institutions for development. This is an organisation inter-posed between States and Central Government in channelling finance and rendering technical guidance for development of marketing and processing cooperatives. While the functioning of the NCDC encompasses the activities of all types of cooperative institutions in their entirety the functioning of the National Agricultural Cooperative Marketing Federation limits itself to the agricultural marketing sphere. In view of the expanded role the cooperative institutions are expected to play in marketing agricultural commodities, we are of the view that there is need to strengthen these organisations so as to enable them to operate efficiently in the new context.

56.6.11 The Ministry of Agriculture and Irrigation which has to discharge the responsibility for formulating agricultural marketing policies, should be enabled to have a more decisive voice in the formulation of policies of public sector corporations like the Cotton Corporation of India, the Jute Corporation of India, the Tobacco Board etc. While in the case of commodities like sugar and vanaspati, the policy decisions are taken by the Department of Food, Ministry of Agriculture and Irrigation, in the case of other important commodities like cotton, jute, tobacco etc. important policy decisions such as support prices are taken by the Ministry of Commerce. Obviously, it is only the Department of Rural Development in the Ministry of Agriculture and Irrigation which is concerned on matters affecting the marketing of these important agricultural crops. Therefore, even if for certain reasons these public sector agencies are to remain outside the Ministry of Agriculture and Irrigation, the Department of Rural Development in the Ministry of Agriculture and Irrigation should be given a more positive role in formulation of policies affecting the cultivators of these crops.

56.6.12 To ensure that while formulating policies, the Department of Rural Development in the Ministry of Agriculture and Irrigation has, the benefit of advice on the recent developments in the field of marketing and to coordinate overall marketing policies, there is need to set up a forum where specialists in the related fields could meet and exchange views and ideas on major policy issues. It is accordingly recommended that a "Central Advisory Committee on Agricultural Marketing" needs to be set up under the Chairmanship of the Principal Secretary in the Ministry of Agriculture and Irrigation. The Council may consist of the following members:

1. Representative of Indian Council & Agricultural Research.
2. " of Ministry of Commerce.
3. " of Directorate of Economics & Statistics.
4. " of Agricultural Prices Commission.
5. " of Food Corporation of India
6. " of National Cooperative Development Corporation.
7. " of Ministry of Health.
8. " of Ministry of Railways.
9. " of Central Warehousing Corporation.
10. Representatives of four States by rotation.
11. Agriculture Marketing Adviser—Member-Secretary.

7 SUMMARY OF RECOMMENDATIONS

56.7.1 The main recommendations made in the Chapter are summarised below:

1. The existing shandies should be restructured either as assembly or sub-markets depending upon their location, volume of commodities traded and number of buyers and sellers. At the Sub-markets there should be adequate facilities for grading, weighing and storage of all commodities.

(Paragraph 56.1.2)

2. All assembly, wholesale, and terminal markets should be brought under regulation as early as possible.

(Paragraph 56.1.3)

3. Each regulated market should have a market committee duly constituted to supervise the market in accordance with the rules and regulations as formulated by the Agricultural Produce Marketing (Regulation) Acts. Growers should have major representation in the Market Committee. The Chairman and Vice-Chairman should be representative of growers only.

(Paragraph 56.1.5)

4. All commodities of crop and livestock origin, and minor forest produce should be notified at every market to make the Act really meaningful. The levy of market fee should be on *ad valorem* basis. The market area should comprise of a revenue sub-division of a tehsil or taluk.

(Paragraph 56.1.5)

5. Each regulated market should have an adequate marketyard and an administrative block to accommodate officials of the market committees, market functionaries, post and telegraph office and bank. Each market should have an optimum number of warehouses for storing the produce.

(Paragraph 56.1.5)

6. A regulated market should have a minimum number of qualified people to operate the market efficiently. The persons who are vital to operate a market are Secretary, Supervisor, Market Intelligence Inspector, Grader and Auctioneer.

(Paragraph 56.1.5)

7. Sale of produce should be by open auction and/or tender system.

(Paragraph 56.1.5)

8. All State Governments should create a Market Development Fund. This Fund should be utilized for developing weak markets.

(Paragraph 56.1.5)

9. All State Governments should prepare and integrated plan for development of regulated markets on the lines indicated in paragraph 56.1.6.

(Paragraph 56.1.6)

10. Branches of primary cooperative marketing societies should be established at all the regulated markets.

(Paragraph 56.1.7)

11. Farmers' Service Societies should assist the cooperative marketing societies at all markets and perform marketing functions on their own at locations where cooperative marketing societies do not exist.

(Paragraph 56.1.8)

12. Brokers should be phased out from the markets. The question of making payments to producer-seller from banks at the regulated market needs consideration. State Marketing Authority should issue licences to market functionaries operating in more than one market within the State and DMI should be authorised to issue licences to all market functionaries operating at regulated markets in more than one State.

(Paragraph 56.1.12)

13. All inputs needed by the farmers for agricultural operations should be made available to them through any of the existing three channels namely, Primary cooperative marketing societies, agro-industries corporation and sale depots of the private traders.

(Paragraph 56.2.2)

14. Research should be done in improving pre-harvest treatment of crops, and to prevent post-harvest losses and also to improve the quality of products intended for marketing. The economics of using mechanical driers to avoid microbial contamination in pepper berries needs immediate attention. There is an urgent need to standardise the drying and bleaching process in case of ginger. Using cow dung cooking and use of lead salts to brighten the colour of turmeric should be discouraged. Suitable alternative methods should be evolved.

(Paragraphs 56.3.2 & 56.3.3)

15. The existing tobacco flue-curing barns should be modified to improve the efficiency of fuel utilisation.

(Paragraph 56.3.4)

16. Steps should be taken to establish ribboning and decortication centres in jute growing areas and these should be operated either through the village panchayats or Farmer Service Societies.

(Paragraph 56.3.5)

17. To break the monopoly of the private sector, a chain of efficiently operated processing units should be established in the co-operative sector. To ensure regular supply of raw materials, they should be linked with the primary cooperative marketing societies. Marketing orders and market agreements between growers and processors should be encouraged.

(Paragraph 56.3.7)

18. Existing sheller mills for paddy should be modernized since they are economical for medium capacity milling. The number of modern rice mills to be established and their location should be decided only after a detailed feasibility study. The price policy of the Government should be such as to provide stability to the marketing system and encourage modernizing of rice mills.

(Paragraph 56.3.8)

19. Traditional *dal* mills should be phased out and instead mills equipped with improved technology based on research findings of CFTRI should be established.

(Paragraph 56.3.9)

20. New type of gins and presses should be installed in future. Local firms should be encouraged to fabricate these in the country. Processing units in the cooperative sector should be established to handle at least 50 per cent of cotton produced in the country in order to break the monopoly of the textile industry and save producers from exploitation.

(Paragraph 56.3.10)

21. Low cost, small capacity sugarcane crushers should be designed and popularised in the rural areas.

(Paragraph 56.3.11)

22. Feasibility studies should be conducted before establishing processing units so as to utilize the capacity to the maximum and to operate it at the lowest cost possible.

(Paragraph 56.3.12)

23. All markets brought under regulation should have facilities to grade all agricultural commodities. Procedure for grading at producer's level should be simplified by laying down one or two recognized quality factors looked for by buyers in the case of each kind of produce at this stage of marketing.

(Paragraph 56.3.15)

24. Grading supervisors and graders working at regulated markets warehouses of FCI, CWC, SWC and primary cooperative marketing societies should either be employees of the State or Central Marketing Department only.

(Paragraph 56.3.16)

25. Grading of all agricultural commodities raw as well as processed, intended both for intra-state and inter-state trade should be compulsory. All products meant for inter-state trade should be graded, inspected and certified by the staff of the DMI.

(Paragraph 56.3.16)

26. All commodities of crop, livestock and fishery origin (both raw and processed) intended for export should be graded and inspected before shipment by DMI only acting as an Export Inspecting Agency on behalf of the Export Inspection Council.

(Paragraph 56.3.16)

27. A Committee should be constituted by RBI to examine the credit needs of all agencies performing marketing functions.

(Paragraph 56.3.20)

28. A Perishable Agricultural Commodities Act to suppress unfair and fraudulent practices in inter-state trade of perishable agricultural commodities should be enacted.

(Paragraph 56.3.21)

29. State marketing department should provide temporary physical facilities for orderly marketing to take place at cattle fairs and also depute their officials to supervise trading practices.

(Paragraph 56.3.22)

30. Separate space should be earmarked within the marketyard for trading in livestock. Arrangements for supervising trading should be provided at small towns, where there are no regulated markets.

(Paragraph 56.3.23)

31. PCMS or wool boards should assist sheep breeders in assembly, grading, transport and selling of wool.

(Paragraph 56.3.25)

32. Curing centres should be established in rural areas and also at places near slaughter houses.

(Paragraph 56.3.26)

33. Poultry farmers associations or cooperative marketing societies should collect, grade, transport and organise sale of eggs in terminal markets on behalf of poultry breeders. They should set up more processing plants in urban areas.

(Paragraph 56.3.28)

34. Village roads should be improved by Zilla Parishads and roads between market centres to towns by Public Works Department. Market Committees should contribute from their revenue towards development of these roads.

(Paragraph 56.4.1)

35. The conventional bullock cart needs to be redesigned so as to improve technical efficiency and increase the rate of return on

capital invested and the task of redesigning and field testing should be entrusted to the regional research-cum-testing centres set up by Indian Council of Agricultural Research.

(Paragraph 56.4.2)

36. Construction of all weather roads in hilly areas where fruits and vegetables are grown should be taken up on priority basis and introduction of helicopter service in the inaccessible areas needs consideration.

(Paragraph 56.4.3)

37. Efforts have to be made by railways to reduce detention time at transshipment points, avoid procedural delays at the time of booking and unloading and increase the number of quick transport services.

(Paragraph 56.4.4)

38. Sample traffic surveys should be conducted in selected areas to collect data on quantity and type of commodities moved to find out wasteful use of transportation facilities and suggest better methods.

(Paragraph 56.4.5)

39. Freight structure for fruits and vegetables needs to be rationalized. The number of refrigerated and insulated wagons should be increased. The wagons carrying perishables should be attached to express or mail trains.

(Paragraph 56.4.6)

40. Special type of trucks should be designed to transport perishable commodities and covered sheds provided at checkpoints on highways where the trucks are likely to be detained for sometime.

(Paragraph 56.4.7)

41. Detailed studies have to be conducted regarding the requirement of type of rail vans (insulated, refrigerated van 0°C temp., and refrigerated van at -20°C) needed at each production centre and marketing centre so as to make maximum use of scarce finance available.

(Paragraph 56.4.8)

42. Research should be conducted to assess the impact of transport on the condition of livestock. Special types of trucks should be designed to prevent bruises and shrinkage during transit.

(Paragraph 56.4.9)

43. Cardboard boxes should be used for fruits being despatched to long distances. Similarly, scientific use of paper for wrapping fruits and for padding and lining to prevent losses should be adopted,

(Paragraph 56.4.10)

44. Improved storage structures needed by farmers should be manufactured by agro-industries corporations and entrepreneurs as per

ISI specifications. Research studies on designing improved storage structures using locally available material should be taken up by state agricultural universities.

(Paragraph 56.5.2)

45. The existing staff at the block level should be trained to conduct demonstration and training of farmers in the method of scientific storage and pest control.

(Paragraph 56.5.4)

46. Rodenticides and fumigants should be used for controlling loss in storage due to rodents and insect pests.

(Paragraph 56.5.5)

47. Grains should be properly dried and moisture content brought down to 8 per cent before storing. Fumigation of storage structures and dipping of bags in solutions of malathion or pyrethrum should be done by trained personnel only.

(Paragraph 56.5.6)

48. When there are discolouration or signs of bad smell in bulk stored grains, they should be removed and cooled so as to prevent further damage. All bags containing grains should be stacked over dunnage and kept away from walls.

Paragraph 56.5.7)

49. The existing All-India Coordinated Project on Grain Storage should be suitably modified and instead an All-India Coordinated Research Project on Post-harvest Technology should be instituted under ICAR, with the coordinator at Hapur and research units at all state agricultural universities.

(Paragraph 56.5.8)

50. Government should not depend on private agencies to store foodgrains needed for public distribution. The storage capacity of FCI, CWC and SWC should be increased to store foodgrains required in cities, industrial towns, drought prone areas and flood affected areas.

(Paragraph 56.5.10)

51. The cooperative marketing societies and regulated markets located in cotton growing areas should plan an increase in the capacity of warehouses taking into account the likely areas. CCI should advance money to producers on the warehouse receipt issued by CWC, SWC and PCMS.

(Paragraph 56.5.11)

52. Cooperative marketing societies have to be organised in jute growing areas, to provide the much needed storage and credit facilities at the assembly points and regulated market complexes.

(Paragraph 56.5.12)

53. In view of fall in prices of fruits and vegetables below economic levels, immediately after harvest for lack of storage and transport facilities, adequate measures have to be taken by cooperatives and public sector undertakings to provide cold storage facilities in production areas and terminal markets. The question of fixing maximum rental charges and the possibility of earmarking a certain percentage of cold storage for primary products under Cold Storage Order, 1964 needs examination.

(Paragraph 56.5.13)

54. FCI should concentrate on construction and maintenance of silos and flat type warehouses to store foodgrains needed for public distribution system and buffer stock on priority basis.

(Paragraph 56.5.15)

55. Since many quasi-government agencies and Cooperatives are engaged in construction and operation of warehouses in each state, a Committee consisting of representatives of FCI, CWC, SWC and Co-operatives should be set up to coordinate the activities of these agencies.

(Paragraph 56.5.16)

56. Courses leading to a Degree in Agricultural Marketing should be instituted at agricultural universities.

(Paragraph 56.6.1)

57. Diploma course in Agricultural Marketing of one year duration, Senior Level Course for Market Secretaries and Grading Supervisors Course should continue to be organised by DMI. Graders Courses for specific commodities should be conducted by the state marketing departments.

(Paragraph 56.6.2)

58. All-India Co-ordinated Research Programme on Agricultural Marketing may be initiated under the aegis of ICAR.

(Paragraph 56.6.5)

59. Extension education in marketing should be improved. "Agmark" exhibitions should be held in rural areas. Extension literature in marketing should be distributed through Regulated markets, PCMS and FSS to farmers.

(Paragraph 56.6.6)

60. Enforcement of rules and regulations is vital to prevent malpractices. The DMI should be suitably strengthened to perform the functions. Hence four units each headed by an officer of the rank of Jt. Agricultural Marketing Adviser should be set up at the DMI. The four units are:

1. Grading, standardization, inspection and certification.

2. Market surveys, co-ordination and extension.
3. Training, planning and development.
4. Supervision and regulation.

(Paragraph 56.6.8)

61. Each States should have a Directorate of Agricultural Marketing. State Agricultural Marketing Boards should be set up in those States where they have not been set up. The Boards should have both advisory and policy functions.

(Paragraph 56.6.8)

62. A Central Advisory Committee on Agricultural Marketing should be established with Principal Secretary in the Ministry of Agriculture and Irrigation as Chairman, and consisting of representatives of departments concerned with different aspects of agricultural marketing and four State Governments by rotation.

(Paragraph 56.6.12)



APPENDIX 56.1

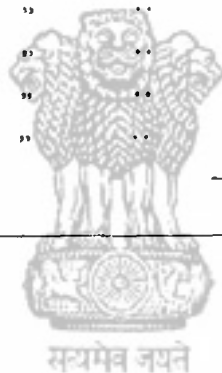
(Paragraph 56.3.14)

Quantity and Estimated Value of Commodities Compulsorily Graded under Agmark for export during 1968-69 and 1973-74

Commodity	Unit	1968-69		1973-74	
		Quantity	Value (Rs.)	Quantity	Value (Rs.)
1	2	3	4	5	6
cannhempt tobacco . . .	bale	43,427	9,379	13,693	4,570
(unmanufactured) . . .	Tonnes	61,800	314,661	92,693	738,123
bristles	„	107	17,949	179	24,295
wool	„	8,813	48,678	5,506	54,058
lemongrass oil	„	364	16,652	535	29,725
sandalwood oil	„	141	36,521	102	46,486
goat hair	„	4,168	6,602	4,589	6,744
palmarosa oil	„	27	4,041	15	2,432
myrobalans	„	6,259	2,096	4,089	2,413
black-pepper	„	19,157	76,654	32,165	245,222
cardamom	„	1,276	64,905	2,023	125,397
chillies	„	9,482	22,778	311	2,157
vetiver oil	„	0,261	77	1	240
walnuts	„	5,570	27,096	4,217	33,070
groundnut oil	„	121	440	..	1
castor oil	„	27,320	69,720	36,560	38,783
linseed oil	„	1	2	..	..
til oil	„	..	..	4	34
safflower oil	„	..	..	..	..
animal casings	'000 hanks	15	20,697	27	21,629
	'000 rings	1,371		1,478	
	tonnes	..		5	
turmeric	tonnes	6,657	22,276	8,651	37,734
ginger	„	1,633	8,747	5,533	25,880

APPENDIX 56.1 (Contd.)

1	2	3	4	5	6
tender leaves	tonnes	3,947	10,357	1,934	7,019
onion	..	115,613	45,786	71,426	53,758
garlic	..	3,075	2,351	506	1,289
table potatoes	..	175	98	176	166
pulses	..	25,311	36,601	2,614	5,190
fennel seed	..	..	..	1,959	8,735
fenugreek	..	..	..	1,194	3,656
celery seed	..	..	..	3,338	13,823
coriander seed	..	..	..	935	2,962
curry powder	..	..	..	1,131	6,023
cummin	..	..	..	585	5,813
total value			865,164		1,747,430



APPENDIX 56.2

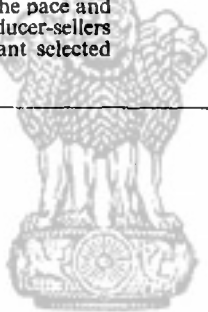
(Paragraph 56.3.18)

Information on Periodical Collection and Dissemination of Market Intelligence Data

Kind of Data	Agency Responsible
1. area, production & yield of crops	Directorate of Economics and Statistics, (DES), Ministry of Agriculture & Irrigation (DES); Revenue and Agriculture Departments of States
2. prices	
(a) wholesale, retail, harvest and farm prices of agricultural commodities	DES
(b) administered prices	
(c) spot and future prices	Forward Markets Commission
3. arrivals, despatches, stocks and storage	
(a) weekly data on arrivals and despatches of major agricultural commodities; information on trade stocks and stocks with principal processors like rice mills	DES
(b) fortnightly returns on stocks, receipts and deliveries	licensed foodgrain dealers to district authorities
(c) monthly closing stocks in respect of Central and State Governments, co-operative societies etc.	DES from the Central Warehousing Corporation
(d) monthly compilation of information on storage space available with the Warehousing Corporations, Government, cooperatives and trade	Central Warehousing Corporation
(e) number of cold stores, their capacity, hire charges, commodity-wise utilisation etc.	DMI
4. annual statistics on movement of agricultural commodities by rail/river	Director General of Commercial Intelligence & Statistics, Calcutta
5. monthly publication of quantity and value of important agricultural commodities as exported or imported	Do.
6. grading statistics relating to agricultural commodities	DMI

APPENDIX 56.2 (Contd.)

Kind of Data	Agency Responsible
7. bank advances	
(a) data on advances given by scheduled banks to traders against hypothecation of stocks	Reserve Bank of India
(b) fortnightly all-India and State-wise information on bank advances from the RBI	DES
8. study of marketing margins in respect of selected commodities on the basis of market charges; cost of transportation, handling and processing; prices at different stages of marketing	DES
9. study for obtaining information relating to factors influencing the pace and pattern of sales by the producer-sellers in the hinterland of important selected markets	DES



सत्यमेव जयते

PROCESSING AND AGRO-INDUSTRIES

A number of agro-industries are already well established and in their case it is just a matter of ensuring supplies of raw materials. The emphasis in this Chapter is on the expanding uses of agricultural commodities in agro-based industries. There are certain industries which deal with the processing of agricultural commodities like rice polishing and parboiling, conversion of pulse grains into *dal*, ginning of *kapas*, crushing of oilseeds and *gur*-making and so on at farmer's level. The problems of such processing industries have been discussed in Chapter 56 on Marketing, Transport and Storage. This Chapter deals particularly with the processing of perishable agricultural products like vegetables, fruits, meat and fish requiring preservation. The role of state agro-industries corporations in regard to processing and agro-industries has also been specified.

1. PROCESSING

57.1.1 The term 'processing' is used in more than one context. The first stage of processing starts at the producer's level itself, whereby he subjects his produce to certain treatments in order to make it fit for sale. Commodities like fruits, vegetables and eggs are sorted out according to size, shape and colour; this form of grading the produce in a way constitutes the simplest form of processing. Cleaning of grains before sale is also a simple form of processing. Then curing of tobacco leaves and extraction of fibre from sannhemp and jute sticks also constitute processing at farmer's level. Oftentimes, the farmer does not sell his sugarcane or oilseeds directly, but prefers to prepare *gur* or crush oil and then sell these latter commodities. In such cases, even *gur*-making and oil crushing constitute processing at the farmer's level. Then, in certain cases, even after the farmer has sold the produce, it is still not in a directly utilizable form, e.g. paddy requires dehusking, pulses require to be split into *dal* and *kapas* needs to be ginned. Such treatments, which certain commodities require after the sale at the farmer's stage and before purchase at the consumer's stage, are also considered under processing. Further, the treatments by which many vegetables, fruits,

meat and fish are preserved either for absorbing the surpluses or for making the produce available for off-season use, constitute another form of processing. Lastly, even biscuit making and bakery products manufacture are forms of processing, which are more manufacturing than agricultural.

57.1.2 Chapter 56 on Marketing, Transport and Storage has considered the first and second stage processing of agricultural produce. Some of the recommendations made in that Chapter are:

- (i) modification of the designs of tobacco flue-curing barns to make them more efficient;
- (ii) popularising, in the case of jute, the use of ribboning and decorticating machines and of small *pukka* cisterns for retting;
- (iii) setting up of processing units in the cooperative sector for crop produce so as to cover not less than 50 per cent of the finished goods;
- (iv) modernisation of rice mills, phasing out the traditional shelling and hulling mills;
- (v) fitting traditional *dal* mills with better machinery, which gives higher recovery;
- (vi) adoption of improved gins for cotton; and
- (vii) greater attention to *gur* and *khandsari* making techniques.

57.1.3 It has been stressed in Chapter 56 that grading and standardisation must cover all agricultural commodities. Research studies are required to be undertaken for formulating changes in the existing grades and also for evolving new grades for such commodities which have not been covered so far. Grading and standardisation should be compulsory at all the stages whether at producer's level or at the stage of internal trade or export. Specific attention is being paid in the present chapter to problems relating to the preservation aspect of vegetable, fruit, livestock and fishery products.

Processing of Perishable Products

57.1.4. Processing of perishable products has been quite common within the country on family scale. Beans, chillies, bitter gourd (Karela), fish, etc. are dried in variously treated forms. The processes of picking, *chutney* and *murabba* making are also used in almost every household. These processes are now taking a commercial shape on scientific lines and require to be encouraged. The consumption of processed products is bound to increase in popularity with the housewives participating in remunerative jobs in cottage industries, factories or offices. Being hygienically produced and in

ready-to-serve form, these will have a greater appeal in travel, *melas* and picnics. Such products are particularly useful for the Defence forces which are stationed at distant places, often in very difficult terrains. Even in the past, the country's Defence forces have relied on these products. Another important avenue for expansion is the international trade in these products. Committees and delegations have been sponsored occasionally to assess the scope of increasing trade in these commodities. The immediate object has mainly been to push the material which is already processed in the country without regard to the likes and dislikes of the people of importing countries. If this lacuna can be removed by the Embassies keeping a constant watch over the kinds of commodities required, the form of preservation preferred and taste preferences of different countries, there is scope for expanding the exports of these commodities. Owing to these reasons, there will be no dearth of demand for processed products. The marketing structure, which has been outlined in Chapter 56 on Marketing, Transport and Storage, will facilitate the off-take of these products without causing gluts. The prospects of important commodities are discussed in the succeeding paragraphs.

Dehydration of Vegetables

57.1.5 Dehydration on commercial scale has been successfully tried so far in the case of peas only and it is likely to keep pace with the demand in future. Attention was also concentrated in the late sixties through Indo-Bulgar collaboration to establish some dehydration units for onion. The Government of India licensed 13 units with a capacity of about 15,000 tonnes per year. The progress has been slow and not more than six units have been installed so far, but the demand for dehydrated onions for export and defence needs are likely to increase and the installed capacity will prove useful. What is needed is the availability of appropriate varieties, which has already been stressed in Chapter 23 on Horticultural Crops. Such steps have to be taken specially in the case of tuber crops. It has been envisaged to increase production of tuber crops to a fairly high level in order to enable them to substitute and supplement cereals. Potatoes require careful attention after harvesting and planning is necessary to determine what quantity can remain in circulation in fresh form to meet the needs in various parts of the country, how much can be accommodated in cold storages and what part would still remain in surplus. It is also very necessary that a major part of this surplus is preserved in dehydrated form. The quantity will be so large that it would be beyond the scope of small scale industries. It

would be advantageous to instal large plants close to the main markets in order to avoid delay and save time and money in transporting potatoes to the factories. Under this system, the producers will be saved from distress sales because of in-season gluts.

Canning of Fruits and Vegetables

57.1.6 *Murabbas* (preseryes), *achars* (pickles), *Sharbats* (syrpus) have been in use in this country since times immemorial. The manufacture of mango *chutney*, which cause the fancy of the early Britishers, appears to have been started on a commercial scale by the middle of the 19th century. The consumption of *chutney* was then confined mainly to foreigners and Anglo-Indians. Subsequently, it spread to the United Kingdom and some other countries too. Preservation of fruits and vegetables by modern techniques is, however, of recent origin in India. Items like jams, jellies, marmalades, fruit squashes, ketchups, canned fruits and vegetables came to be known in this country only after the First World War, when these products were imported freely on a large scale. Their manufacture in India is said to have started only in the late twenties. The earliest efforts for developing fruit and vegetable processing industry in the country on modern scientific lines can be traced to the pioneer work done under the then Imperial Council of Agricultural Research at Lyallpur and Quetta in the early thirties. As a result, small processing units, mainly specialising in fruit beverages, using mostly citrus fruits, came into existence at that time. During the Second World War, the import of canned and preserved stuffs, the demand for which from the army had considerably increased, was greatly affected owing to shipping and other difficulties. As a result, the industry got a fillip and many units sprang up in the cities of Bombay, Calcutta and Delhi, where raw materials were easily available. The demand for processed fruits and vegetables for the Defence Services declined considerably after the cessation of hostilities in 1948. Further, the industry faced a threat from imported products that had started pouring in then. Certain tariff protections were then considered necessary. The industry continued to enjoy tariff protection up to 1957 varying between 40 and 80 per cent *ad valorem* for selected products in the early years and up to 40 per cent later. The Government of India later adopted a policy of imposing restrictions on the imports. Since 1958, no imports of fruit and vegetable products were permitted excepting small quantities of asparagus, mushrooms, etc., which were required by the hoteliers for catering to the needs of the tourists.

57.1.7 The fruit and vegetable processing industry continued to receive consideration of the Government during the plan periods also. At the instance of the Planning Commission, the then Ministry of Food and Agriculture set up a Panel of Experts in 1955, with the Agricultural Marketing Adviser as its Convener, to draw up a detailed programme for the development of the industry during the second Plan and also indicate the targets to be achieved. For achieving these targets, the Panel made a number of recommendations which were similar to those made earlier by the Tariff Commission. Since then, a number of committees and panels have been constituted by the Government of India to review the development of the processed fruit and vegetable industry in India, to assess the scope for its further development and to recommend suitable development measures. The recommendations have covered the following points:—

- (i) need for a coordinated programme of horticulture and fruit and vegetable processing;
- (ii) direct contact between the growers of fruits and vegetables and processors;
- (iii) facilities for research to evolve new techniques and standardise recipes and method of manufacture of fruit and vegetable products and by-products utilisation as well as for training of fruit technologists;
- (iv) development of allied industries such as, manufacture of containers and closures (covers), essences and chemicals and equipment and machinery used by the fruit and vegetable processing industry;
- (v) mechanisation of the industry;
- (vi) grant of subsidies and incentives like the removal of drawbacks of duty on tinplate, sugar, railway freight to the processors to encourage exports; and
- (vii) marketing programme for popularising the products.

57.1.8 An idea of the progress made by the fruit and vegetable processing industry in India can be had from the data presented in Table 57.1.

TABLE 57.1
Manufacture of Fruit and Vegetable Products¹ *

Year	Quantity (tonnes)	Value (Rs. lakhs)
1952	9,480	154
1956	17,232	189
1961	28,569	460

Year	Quantity (tonnes)	Value (Rs. lakhs)
1962	32,657	580
1963	34,856	661
1964	38,237	776
1965	46,395	1014
1966	43,206	1055
1967	45,542	1253
1968	40,158	1175
1969	42,404	1216
1970	49,116	1438

1. 1972, Fruit and Vegetable Industry in India, 1951-63, 1970. Nagpur, Directorate of Marketing and Inspection, Ministry of Agriculture, Government of India.

*Excluding aerated fruit beverages and synthetic products.

The production has increased five times since 1952, the quantity in 1970 being about 49,000 tonnes and the value about Rs. 14.4 crores (excluding aerated and synthetic products). It is worth mentioning that about 85 per cent of the production comes from large manufacturing units having an annual capacity of 250 tonnes and above. Information gathered from the All India Fruit Preservers' Association, New Delhi indicates the following proportion of utilisation of the excisable products of the processing industry:—

Year	Percentage share of		
	Export	Defence	Civil
1965	7.0	23.7	69.3
1966	8.7	23.1	68.2
1967	10.5	19.0	70.5
1968	11.4	14.8	73.8
1969	26.4	18.1	55.5
1970	21.0	23.0	56.0

An idea of the order of India's exports of fruit and vegetable preparations can be had from the information given in Appendix 57.1. What is relevant to note from this Appendix is that mango products

predominate in the list. Besides mango, other fruits arranged in descending order of importance in the processing industry are pineapple, orange, lemon and lime, apple, aonla (*Phyllanthus emblica* sp.) and guava. Vegetables which are important are peas, tomato and potato (canned). The other fruits and vegetables which are exported to some extent or the other in processed form are apricot, bel (*Aegle marmelos*), peach, plum, strawberry, lady's finger, brinjal, cabbage, carrot, cauliflower, kerala (bitter gourd), kundru (*Coccinia indica*), mustard green, parwal (*Trichosanthes dioica*), spinach, tinda (*Citrullus vulgaris*), turnip, chillies and ginger.

57.1.9 Considering the progress which the industry is making, there should be no doubt that it is poised for a gradual development in conformity with the needs of the country. A serious bottleneck in the expansion of the fruit and vegetable processing industry is the non-availability of suitable containers at reasonable price. Glass containers account for about 78 per cent of the packings and tin containers for another 20 per cent. Glass containers are used for packing products like jams, jellies, pickles, chutneys, tomato products and beverages, where sterilization of the product is not necessary because of high sugar content or use of chemical preservatives or high acid content. High cost of glass containers is associated sometimes with the artificial scarcity of raw materials like silica sand and soda ash created by transport bottlenecks. This is, however, not an insurmountable problem when viewed in a long run perspective. Tin cans are used for products which require hermetical sealing and heat sterilization for preservation. Such products, e.g., sliced fruits and vegetables, are fewer and have not yet become articles of general use and whatever is canned at present is mostly for defence and export purposes. Tin cans are manufactured from tin coated steel plates of superior quality having low phosphorus content. Manufacture of tin plate has started only recently in the country and it has not yet been possible to produce tin plate of the desired phosphorus content so far. The country has, therefore, to import tin plate from several countries to even meet the modest requirements. However, the incidence of local taxes and other expenditure on imported tin plate is very high and this raises the cost of the tin can. An idea of the expenditure involved on the imported tin plate can be had from the following figures (obtaining on March 31, 1975):

	(Rs.)
cost of one tonne of tin plate	4,362
insurance charges	30
customs duty	1,990

	(Rs.)
countervailing excise duty	390
equilisation fund	350
HSL (Hindustan Steel Ltd.) Commission	189
clearance and transportation	65
total cost per tonne of tin plate	<u>7,376</u>

It can be seen that for one tonne of tin plate costing Rs. 4,362, the incidence of expenditure on other items comes to Rs. 3,014, i.e. 69 per cent.

57.1.10 A 'drawback' of Rs. 1,700 per tonne is allowed on cans used for packing products for export. No such drawback is allowed on tin plate used for manufacturing cans for internal consumption. As against this, tin plate is available in most of the horticulturally advanced countries at about Rs. 4,000 per tonne and the cans are, therefore, available to the can fabricators at almost half the Indian price. Another difficulty which has been often encountered even in the case of cans manufactured from imported tin plate relates to the non-uniformity in quality because it is obtained from different sources. Due to poor quality of the tin plate, the fruit products manufacturers had often to suffer heavy losses in the past. It is, therefore, essential that the steel manufacturing factories in the country should attend to the problem of manufacturing tin plate of low phosphorus content and make the same available to the fabricators in adequate quantities at reasonable cost. Till such time the steel industry is able to produce tin plate of the desired quality, adequate quantities of tin plate may be imported to meet the demand of the processing industry not only for export but for internal consumption as well. The incidence of various kinds of charges levied on imported tin plate has to be restructured suitably so as to reduce the cost of cans. Even in general, whether it is glass or tin or any other kind of container, there is an increase ranging from 25 to 30 per cent over the ex-factory price of the canned or bottled product due to Central excise, Central sales tax, State sales tax (single point or multi-point) and town duty/octroi. There is a clear case for relieving the burden cost by the various taxes in such a way that the total realisable amount over a product does not exceed 10 per cent of its ex-factory cost.

57.1.11 Glass containers have the advantage of reuse in contrast to tin containers. However, to replace tin cans for packing dessert fruits and vegetables the glass should be able to withstand heat of sterilization and the jars be in a position to be sealed airtight.

Imports of such jars, popularly known as the canning jars, are now negligible and domestic glass industry should be encouraged to manufacture them.

57.1.12 Plastic containers can be used for those products which do not require heat sterilization for preservation. Their cost is comparatively lower than that of glass or tin and they can be reused. The research work on producing plastic containers is already in progress in the country; this could however, be expedited.

57.1.13 In the case of canned fruits and their jam, jelly or pulp preparations, sugar is an important item in the cost structure. Sugar is made available to the processing industry at the international price for that fraction of manufacture which is meant for export, but the ordinary processor has to procure sugar at the open market rates. It will be good if sugar is made available to the fruit processing industry at a concessional rate on a uniform basis without distinction between processing for export and domestic use. The controlled rates as prevalent from time to time, could be the basis of concession. Besides sugar, the cost of fruits, which constitute the raw material, can also be brought down. Around 40 per cent of the fruits in market are either undersized or oversized, deformed, spotted or damaged. Such defects reduce the visual appeal for table purposes, but their quality as food is not affected in any way and, therefore, such fruits are quite suited for jam, jelly and pulp preparations. If fruits discarded for table purpose could be separated through grading, they could be made available to the processing industry at cheaper rates than the rest of the material. This should apply equally to tomato, from which also preparations like juice and pulp are prepared. The Indian Standards Institution (ISI) has already formulated specifications for grading for many fruits and vegetables, but the grading continues to be voluntary at present, specially at wholesaler's level. It is desirable to introduce compulsory grading of fruits and vegetables according to these standards so that the availability of the right quality fruits and vegetables for the purpose of processing could be ensured at reasonable rates. However, for their quick and economic utilization, it would be necessary to arrange for processing units near the market sites and this can best be done by organising the activity in the small and medium sectors. The Small Scale Industries Development Organisation has already drawn up schemes for processing of fruits and vegetables and this fits in with our viewpoint.

57.1.14 When the use of preserved fruits and vegetables is being contemplated on a large scale, it is vital to ensure that the

health of consumers is not jeopardised. The use of harmful colours is already prohibited and is on the decline. The problem is about the preservatives and long contact of ingredients with tin or other kinds of containers including plastics. It needs to be studied whether these carry health hazards when used constantly under tropical conditions and if so, what is the remedy. Research is needed on these problems. The Fruit Products Order 10 of 1955 (FPO) governs all kinds of products obtained from either fresh or dehydrated or frozen fruits and vegetables. The FPO is so extensive as to cover even the aerated waters which contain fruit juices or pulp and synthetic beverages, syrups, *sharbats* and vinegar (e.g., diluted acetic acid). This Order lays down minimum sanitary specifications for the physical environment, the water used in manufacture and for the fruits and vegetables themselves. It is felt in industrial quarters that hygienic standards laid down in the order are not realistic in the country's prevalent conditions and are often rigid, because these have been adopted from the west, especially UK. It is desirable to allay these fears and determine experimentally the microbial and sanitary specifications which could be prescribed for various products under local conditions. Besides the Fruit Products Order, the Army Supply Corps' specifications lay down that, *inter alia*, the jam shall be free from preservatives. The preservatives, which are commonly used, are (a) benzoic acid and its salts (e.g., sodium benzoate) and (b) sulphur-dioxide and its derivatives (e.g., sodium and potassium metabisulphites). The Army Supply Corps' specifications do not mention the quantities beyond which the preservatives are harmful. This creates a difficulty, because sugar, as manufactured in India, does contain some minor quantities of sulphur. Owing to this reason, the products are sometimes rejected. Moreover, many fruits also contain sulphur to some extent. Therefore, it would be better to determine the injurious levels of sulphur dioxide and specify the same rather than stating that the product should be free from it completely.

Processed Products of Animal Origin

57.1.15 It has been mentioned in Chapter 36 on Meat Production and Animal Byproducts that processed meat products mainly consist of pork, ham, bacon and sausages and that factories which would come up by the end of the Fifth Five Year Plan would be able to meet the needs of the whole country for a long time to come. Besides bacon, another profitable line which apparently seems to hold promise is the utilization of broiler and culled birds. Mature birds yield

greater quantity of meat than young chickens. Their meat is fibrous, but it can be rendered soft in the processes of canning. Therefore, their use in canning requires to be explored. Insofar as the fishery products are concerned, the industry is already well established and is capable enough to look after its future interests with the aid of the Government. The main products which are available in processed form are frog legs (frozen, canned), turtle meat (frozen), prawn (chilled, frozen, powdered or canned), lobsters (fresh, chilled or frozen) and fish (wet salted, dried smoked or canned). Substantial exports of these commodities are also effected from the country.

2 EXPANDING USES OF AGRICULTURAL COMMODITIES

57.2.1 The established major industries, which utilise agricultural raw produce of various kinds, number about 120 grouped under 43 broad categories as shown in Appendix 57.2. In their case, future planning essentially means ensuring supplies of raw material according to increasing demands, which aspect has been taken care of in relevant chapters of our Report. A review is made here of the various agricultural commodities chiefly from the angle of new uses. Some pressing problems of the existing industries are also discussed.

Foodgrains

57.2.2 Foodgrains, specially cereals, are used by processing industries in sufficiently large quantities in most of the advanced countries of the world. The bakery industry manufactures, for example, a large number of products like bread, biscuits, buns, cakes, rolls, etc.; breakfast foods industry manufactures corn flakes, rolled oats, wheaties, spaghetti, noodles, macaroni, Bulgar wheat (parboiled and partially debranned grain), recina (rice substitute); starch industry manufactures starch for textile, paper and other industries as well as starch-based products like custard powder, pudding and porridge powders; fermented products manufacturing units prepare malt syrup and other malted products; brewing industry produces alcoholic beverages and power alcohol; oil crushing industry produces oil both for edible and non-edible purposes; chemical industry manufactures pastes and adhesives for various uses, vinegar and other organic acids. The situation in this country has been, however, different so far. Manufacture of bakery products from wheat did receive attention rather early, because these formed food items of daily consumption of the foreigners living in the country. A large number of home

scale units came into being to meet local requirements of the urban population, particularly at the military stations. In course of time, several large scale units were also set up. Manufacture of breads and biscuits required wheat of specific qualities which were not found in local varieties. The required varieties were, therefore, imported from abroad to meet the requirements. However, the picture has changed now and the country has developed many varieties suitable for the purpose. Bread, buns and biscuits have gained popularity even in rural areas. There are a few manufacturing firms in the organised sector and recently a public sector undertaking has also come up in the field. Their products are hygienic, but are not sufficient to cater to the needs of even the urban sector. The units which cater to towns and some villages are in the small sector, where the quality is, however, poor. As this is a matter concerning the health of people and as bakery and confectionery articles have already gained wide popularity, there is need for encouraging the establishment of modern bakery units in towns and rural areas. This will also provide an opportunity to improve the nutritional status of the consuming public by incorporating essential ingredients in the products.

57.2.3 The bakery and confectionery manufacturers utilise at present mostly wheat. Various kinds of millets can also profitably be used, for which purpose efforts have to be made to standardise recipes and formulations using mixtures of different foodgrains. It would be advantageous to make a blend even with some pulses in order to fortify the eatables with proteins. As regards breakfast foods, only maize and oat have been used in the country to some extent for the manufacture of corn flakes and rolled oats. Rice has undoubtedly been used comparatively on a larger scale for preparing *chuda* (flaked rice), *murmura* (puffed rice) and *lawa* (popped rice), but the industry utilises a negligible percentage of rice production in the country for this purpose. These products are popular in rural as well as urban areas. However, methods used in their manufacture are the age old ones and are cumbersome. There is need to modernise these processes and also design suitable machinery for use in their manufacture. Parched grains of maize, jowar, bajra and other foodgrains are used as such and in the form of confections prepared with jaggery. Popcorn is gaining popularity in urban areas. Other grains could also be utilized for this purpose. This may, however, require modifying the machines in use at present or even designing new ones for use with such grains.

57.2.4 Maize is one of the main sources of starch which has numerous uses in industries. Other millets could also be tried for

starch making. All starchy foodgrains can be used in the preparation of glucose syrup, which is in demand in the bakery, confectionery and food processing industries. Steep water obtained from the wet milling of maize and jowar can prove useful in the expanding antibiotics industry, because this serves as a nutrient medium for micro-organisms. In order to reduce the cost of production of antibiotics in the country, this aspect needs a thorough study in the laboratory. Maize grains are useful for preparing dextrans. The several corn growing States of USA and Canada are producing furfural and tetrahydrofuran from cobs on a very massive scale. In an effort to put wheat to industrial uses, American scientists have separated major components of the whole wheat kernel. One of the constituents, gluten, is found useful in the manufacture of plastics, plastic films, detergents, cosmetic finishing agents, rubber products, paper coatings, lubricating oils and greases, protective coatings and metal treating. There is a thinking in the USA that the development of industrial uses for wheat could help in absorbing surpluses of wheat and would make for better financially balanced yearly wheat markets among farmers.

57.2.5 Malt syrup and other malted products are nutritious and, therefore, need to be encouraged. These can be prepared from jowar, barley and small millets specially ragi. Technical know-how for their manufacture is available in the country and action is required to set up suitable units for the purpose. Another fermented product of commercial importance is beer manufactured from barley and other starchy foodgrains. There is already some export of this commodity from the country and there is ample scope for expanding this trade. Hops (*Humulus sp.*) a raw material required in beer making is not available and has to be imported. Its cultivation requires to be encouraged.

57.2.6 A by-product of the fermentation industry is carbon-dioxide. This is partly collected in some units and used in the manufacture of carbonated beverages. The rest of this gas is allowed to go waste. This could be put to better use by collecting it in suitable containers for preserving juices and other liquid products. A very useful step would be to prepare solid carbon-dioxide, popularly known as dry ice, which has been found to be very effective in extending the storage life of perishable and semi-perishable commodities.

57.2.7 There is vast scope for the utilization of pulses in the preparation of protein-rich products, protein concentrates and protein isolates, which are useful in bakery products, infant foods, sausages, canned meat products, dairy products, coffee whiteners, cheese-like

spreads and drips, confectionery products, beverages and drying aids for fruits. Mucilaginous legumes like *guar* are utilized in the preparation of gums which are used as sizing and stabilizing agents. Gums have become indispensable for paper, textile and pharmaceutical industries. India earns foreign exchange of about Rs. 10 crores annually by the export of seeds which yield gum. *Guar* has a major share in this trade. The other important plant is *karaya*. Tamarind and psyllium seeds are also used. Instead of exporting raw seeds, if gum could be manufactured and exported, profits would be still larger.

Commercial Corps

57.2.8 A very attractive and appetising breakfast food and confectionery ingredient known as the golden syrup is made by simple concentration of inverted and caramelised sugar syrup. This is an expensive process involving the use of sugar as a primary raw material. If this syrup could be obtained from the plant itself, the manufacturing cost would be much less and quality better. In the life history of sugarcane, the sugar that is produced in the first six months or so is largely glucose. Theoretically, the sugar in golden syrup should cost only about one-third the cost of cane sugar. It should be acceptable to almost all commercial users of sugar, like soft drink manufacturers, bakers, confectioners, hoteliers, teashop and canteen owners, ice cream manufacturers, etc. There is likelihood that, in course of time, sugar production may become surplus. In that event, rather than reducing the area under sugarcane the emphasis should be to divert some sugarcane production to the manufacture of natural golden syrup. A beginning could be made, perhaps even now, by allocating some sugarcane area for this purpose as a regular feature.

57.2.9 Soyabean is a very rich source of proteins and fats. Soya-bean flour has been used in the manufacture of bakery products, fortified lunch and snacks and foods of high protein content. Soya-bean oil is used in manufacture of shortening, grease, soap, paints and varnishes, resins, inks and fatty acids. Soyabean lecithin is used in bakery products, ice cream, chocolate coating, pharmaceutical oils, cosmetics, rubber and pottery. Soyabean crude acids have found use in the manufacture of adhesive tapes, shaving compounds, grease, emulsifiers, textile lubricants, leather dressing, cosmetics, typewriter ribbons, carbon copying papers, etc. Soyabean modified proteins, protein concentrates and protein isolates are also used in various food

products. The use of soyabean and groundnut for the manufacture of vegetable milk has already been indicated in Chapter 22 on Commercial Crops. It is desirable to encourage this activity to the extent possible.

Horticultural Crops

57.2.10 Tuber crops are a rich source of starch and, therefore, these also have to be exploited for industrial starch. Some trial exports of tapioca starch were made from the country a couple of years ago. The exports could not be sustained because of high cost of production. With the increased production of tapioca as well as other tuber crops as envisaged for the future years, it is likely that the cost might come down and then it would be appropriate once again to explore the possibilities of exports. One of the products manufactured from tapioca starch is sago, for which there are some seven hundred small scale units in Salem district of Tamil Nadu alone. These units draw tapioca tubers from Kerala at present. Sago has appreciable demand in the country and it may, therefore, become necessary to encourage the establishment of sago manufacturing units in all tapioca growing areas. Utilization of tapioca for the manufacture of sago or industrial starch is very necessary even otherwise because the keeping quality of this tuber is very poor.

57.2.11 Garlic powder is used in pharmaceutical preparations and can be easily manufactured in the country. Ginger is also utilized in the preparation of alcoholic and non-alcoholic beverages. Ginger oil and oleoresins are other constituents of ginger which have good potential for export. The dye obtained from rhizomes of turmeric is used for dyeing cotton, silk and woollen fabrics and pharmaceutical preparations. The rhizomes also yield flavouring constituents used in food, cosmetics and pharmaceutical industries and such processed rhizomes can be used for preparing starch. Technical know-how for preparing the various products is available in the country and what is needed is to encourage their production. A mention of some of these potentialities has also been made in Chapter 23 on Horticultural Crops.

57.2.12 Banan stems have been processed to obtain fibre which can be used as a cushioning material and for hessian and sacking. The pseudostem also yields starch. Pineapple leaves yield a fibre which can be used like sisal fibre. Pineapple is also a source of oxalic acid and manitol. Oranges and lemons are used for extracting essential oils from their peels. Pomace from citrus fruits and apple,

guava and papaya are good sources of pectin and are used for the manufacture of this product. Similarly, papaya is the source of papain which is extracted from the latex collected from mature raw fruits. This product has several uses in the pharmaceutical industry.

57.2.13 A large number of medicinal and aromatic plants grow wild in the forests. These have been exploited to varying extent for export to other countries where these are processed to obtain active principles and flavouring constituents and re-exported to this country. Recently some of these and other exotic plants have been cultivated in the country and used for extracting oil. Examples of plant materials exported from the country as raw material are found in *sarpagandha*, *senna*, *Dioscorea* sp. psyllium etc. Recently cultivated plants are palmarosa, patchouly, *Montha piperita*, *Mentha arvensis*, *Digitalis*, *Hyoscyamus* sp., lemon grass, *Atropa belladonna*, *Chrysanthemum cinerarium*. Sandal, khas and cinchona are other plants which have been utilized for preparing oil and essences and quinine sulphate and its other salts which are exported from the country. There does not appear to be any justification for the export of raw materials from the country in any form. It is desirable that suitable restrictions are imposed on the export of such raw material and their exploitation in the country itself for manufacturing finished products for domestic use and export is encouraged.

Plantation Crops

57.2.14 Oil of cardamom is extracted for use in perfumes and medicinal preparations. Oil and oleoresins of pepper are also extracted for use in food, cosmetics and pharmaceutical preparations as flavouring agents. Rubber seeds yield an oil which is use for making soap, paints and varnishes, stabilizers for chlorinated hydrocarbons and factice. The wood of the rubber is used for manufacturing packing cases, panels for tea chests, fibre board paper lignoplastic wood, rayon films and for construction purposes. Cashew apple can be used for preparing non-alcoholic beverage and *feni*—a fermented beverage which has a good export potential. Cashew testa is a rich source of tannin and a proposal is already under consideration for establishing a unit in Kerala for extraction of tannin from this source. Cashewnut shell liquid (CNSL) is a by-product which has several industrial uses for manufacturing lacquers, cements, laminating resins, rubber compounding resins, brake linings, intermediates for chemical industry, composite wood,

insulating varnishes, electrical windings and conductors, coating compounds, water and weather proofings, bituminous solutions, cation exchange resins, printing, stencilling and stamping inks and dyes. Cashew shell is used for preparing water soluble polysaccharides and activated carbon. Recommendations on important aspects of utilization of cashew products have been made in Chapter 24 on Plantation Crops.

57.2.15 Coconut kernel is dried to obtain copra which is eaten as such and is used in confectionery and other food preparations and for expressing oil. Coconut oil is used for cooking and hydrogenation. It is used for making soaps, perfumery and cosmetics, hydraulic brakes in aeroplanes and as plasticiser in the manufacture of superior safety glass for aeroplanes, trucks, tanks and automobiles and synthetic rubber goods. Coconut husk also has several uses as coir, fabrics and their products, ropes, mats, nets, bags, etc. Coconut shell is used for preparing several fancy articles like *hookuh* shells, shell bottles, combs, ladles, bowls, lamps, flower vases, buttons, musical instruments and measures for liquids, charcoal, activated carbon used in gas masks for absorbing toxic gases and vapours. Coconut leaves are used for making brooms, headgears, hats, fans, baskets, fish traps, etc. Coconut water can be used as a nutrient medium for micro-organisms in the production of antibiotics and also as a rubber coagulant. Coir dust has several uses in the manufacture of hard and laminated boards, insulation slabs for use in air conditioning and refrigeration, expansion joint filler, power gas, resins, electroplating additive and vulcanising aid and for preparing furfural.

Forest Products

57.2.16 Lac is an important product obtained from forests. It is processed to produce shellac and bleached lac. Shellac is used for preparing bangles and jewellery, paper and fabric tubes, grease-proof paper, leather finishings, moulded rubber soles, water-proof inks, nitrocellulose lacquers, nail polish, adhesives for dental plates, coating metal foil and brocade thread, hard rubber compositions, glazing confectionery, stiffeners for toes and heels of shoe felt and fur hats, photographic negative varnish, dry mounting tissue paper, printing inks, coloured and lithographic finishes for rubberised fabrics and oil-cloth, finishes for linoleum and coffee beans, playing cards, pyrotechnics and ammunition, stiffening crepe and semi-rigid bandages, tank and steamer coatings, silver backing of mirrors,

cosmetics, hair dyes, enamelled artware and wooden turnery, defence stores and furniture, gramophone records, varnishes, emulsions and enamel paints, sealing waxes and coated abrasives. Lac dye is used for dyeing woollen and silk fabrics and lac wax is used in the preparation of cosmetics, duplicating paper, ribbons and insulating electrical articles.

57.2.17 Timber trees like Mathua (*Madhuca indica*), sal (*Shorea robusta*), neem (*Azadirachta indica*), kusum (*Schleichera trijuga*), Karanja (*Pongamia pinnata*), kokum (*Garcinia indica*), toon (*Cedrela tuna*), nahor (*Mesua ferra*), undi (*Calophyllum inophyllum*), Kannala (*Mallotus philippensis*), tamarind (*Tamarindus indica*), babul (*Acacia sp.*), deodar (*Cedrus deodara*), pine (*Pinus longifolia*), kail (*Pinus excelsa*) and many others yield timber for construction, furniture and fuel wood. Timber of sal is used for making railway carriages and wagons, carts, mine pops, tool handles, and tent pegs and that of toon for making tea chests, cigar boxes, toys, carvings and plywood, babul wood is used for making parts of cart-wheels, plough and other indigenous implements, brake blocks and tent pegs and that of khair wood is used as posts in house construction, in preparing rice pestles indigenous oil and sugarcane crushers, plough, tent pegs, keels and knees of boats and kattha and cutch. Deodar wood is used for railway sleepers, bridges, beams, rafters, boxes, camp furniture, masts, ores and pencils. It is also used for extracting an oil used in perfumery and cosmetics. Pine or chir wood is used for planking for use in house construction, packing case making, roofing, poles, tea chests, fencing and paper pulp. Lisa obtained from pine trees is used for making turpentine oil and resins. The turpentine oil is used in perfumery, cosmetics and medicinal preparations. Kail wood is used for boat construction, matches and pencils, drawing boards, plane tables and patterns. It also yields lisa which is used for oleoresin extraction. These trees yields seeds which are used for extracting oil. Oil from this source is used for the preparation of soap, lubricant and as fuel.

57.2.18 Mahua seed oil is used for hydrogenation and in the preparation of confectionery, sweetmeats, chocolates, candles and for smoothening wool for making it easy to spin. Sal and Kokum seed oil is also used for edible purposes after refining and also as a substitute of cocoa butter in confectionery. Neem oil is used in the preparation of insecticides, perfumery and medicinal preparation. Karanja seed oil is used in leather tanning and medicinal preparations, nahor seed oil in the manufacture of paint and varnishes and that of karanja for dressing of hides and for preparing special resins.

Mahua flowers being rich in sugars are used for preparing syrup, beverage, alcoholic drink, vinegar and medicinal preparations. *Undi* leaves are used as fish poison and its bark as a source of tannin. *Karnala* seed yields a dye powder. Tamarind fruits yield acidic pulp for use in pickles and for souring curries. These are a source of tartaric acid. Tamarind wood is used for making charcoal and its seeds are used for extracting starch and pectin. *Babul* bark is used in leather tanning and in preparing ink while its gum is used as adhesive and in several medicinal products. Considerable quantities of wild apricot are available in the northern parts of the country. Wild apricot kernel contains 40 to 50 per cent of oil rich in oleic acid. This oil, after proper purification and refining, can be used in the manufacture of high grade cosmetics like shaving creams and superior soaps. Oleic acid and sodium oleate, which are valuable lubricating agents and are also used in froth floating and carbon paper industry, can also be prepared from this oil.

57.2.19 Manifold uses of bamboo are well known. Its cane is used for making furniture, walking sticks, spear and lance staves, mat screens, baskets, paper, laminated boards and rayon. Tender bamboo shoots are pickled and used as food and are also canned. Forest grass leaves are used for cordage, matting and for the manufacture of paper and boards. Eucalyptus wood is used for making paper pulp and its leaves yield an oil used in perfumery, cosmetics and medicinal preparations. *Tendu* (*Diospyros melanoxylon*) leaves are used for wrapping *bidi*. These are only a few examples of forest trees yielding valuable products. Exploitation of many of the forest trees could yield a large number of industrial products.

Products of Animal Origin

57.2.20 The byproducts and waste products of animal origin have many industrial uses. These will be considered in the next Section. The main products of sericulture and apiculture have been discussed in Chapters 26 and 27 respectively. It will be interesting to note that byproducts even from silkworm have many uses. Silkworm guts (from glands) are used as surgical sutures. Its pupae yield an oil which is used for making soap, paint and varnishes. Discarded silkworm pupae yield an oil which is used at present in soap making. The pupal meal thus left over is rich in protein and has its utility in livestock, poultry and fish feeding. The tough indigestible chitinous covering is hard to digest but recent investigations carried out at the Central Food Technological Research Institute, Mysore, have indicated that this defect could be overcome by suitable pre-treatment

of the outer coat. The equipment and machinery required for the process has also been fabricated. The process is successfully applied in industry by a few firms in Karnataka. Large quantity of silkworm pupae is available in Assam, West Bengal, Orissa, Punjab and Jammu & Kashmir, besides Karnataka; this quantity is likely to increase further with the expansion of sericulture throughout the country.

An Overall View

57.2.21 An attempt has been made in this Section to consider various uses of the primary agricultural products. The uses enumerated are only illustrative and not exhaustive and should be taken only to indicate the vast potentialities. It also indicates the necessity for an organisation to keep a constant watch on the new uses of all agricultural commodities, which should select the most promising ones for exploitation commercially and make necessary feasibility trials before passing them on to the industries concerned. We strongly feel that a Central laboratory for industrial utilization of agricultural products should be established with the above objectives. This laboratory should have the same status as the other National laboratories. There is no need for this laboratory to duplicate the research work of a very specialized nature which might be the responsibility of other institutions and, for this purpose, proper coordination between the various interests involved is very necessary. The task of the proposed laboratory will be so enormous and varied that it would become necessary for it to seek assistance from other institutions such as the agricultural universities and the Central institutes of the ICAR. Therefore, it is desirable to create small technological units in these institutions also. Preliminary work could be done in these institutions, after which it could be passed on to the Central laboratory for specialised attention and the work in these institutions could also be undertaken according to the references made to them by the Central laboratory from time to time. The proposed laboratory should be set up under the aegis of the ICAR for easy access and coordination among the experts of the laboratory and other agricultural scientists.

3 UTILISATION OF BYPRODUCTS AND WASTES

57.3.1 On a reference from the Ministry of Food and Agriculture, Government of India, the Council of Scientific and Industrial

Research (CSIR) appointed a Committee on the Utilization of Food and Agricultural Wastes in April, 1957. The commodities considered by this Committee were the following:

'bagasse, cotton linters, corn stalk, rice straw, water hyacinth, molasses, tobacco seed & waste, tamarind seed and waste, banana stem, apple pomace, groundnut cake, castor cake, rice bran; wastes accruing from forest products, cashewnut, tea, arecanut, sisal and jute;
bones, blood, entrails, guts, glands, etc; horns and hooves and carcasses of animals, fish and dairy wastes'.

The Committee pointed out¹ the ways of increased utilisation in many cases and felt that facilities for related research work were sufficient at the then existing institutes. Later in December, 1961, Working Group of the Committee on Natural Resources of the Planning Commission reviewed the position.

57.3.2 The salient features of the recommendations of the Working Group of the Planning Commission (1963)² are stated below:

- (i) Rice bran extraction plants could preferably be located within a radius of about 80 km from concentrations of rice mills. The huller type of rice mills should be modernised into sheller type. The responsibility for research work relating to the processing of bran oil should lie with the national laboratories/oil industrial technological research institutes. The Indian Veterinary Research Institute, Izatnagar (Uttar Pradesh) was required to undertake research work connected with the preparation of nutritious compounded cattle and poultry feed out of de-oiled bran.
- (ii) The then Indian Central Oilseeds Committee, All India Khadi & Village Industries Commission and State Governments were required to collaborate in conducting resource surveys of oil bearing plants and non-edible oilseeds in forest areas. The State Forest, Agriculture and Public Works Departments were required to consider development of plantations of non-edible oil bearing trees, like neem, *mahua*, etc. Research status pertaining to non-edible oilseeds and oils was required to be examined and future plans made accordingly by the then Indian

¹1959. Report of the Committee on Utilisation of Food and Agricultural Wastes. New Delhi, Council of Scientific and Industrial Research.

²1963. Survey and Utilisation of Agricultural and Industrial Byproducts and Wastes. New Delhi, Committee on Natural Resources, Planning Commission, Government of India.

Central Oilseeds Committee in collaboration with research laboratories.

- (iii) The then Indian Central Tobacco Committee was required to arrange experiments to explore the possibility of utilising tobacco wastes economically for the manufacture of nicotine sulphate, nicotine acid, etc.
- (iv) A 'Bagasse for Paper Promotion Committee' consisting of the representatives of the Directorate of Sugar & Vanaspati, Department of Technical Development of the then Ministry of Economic and Defence Coordination and the Planning Commission and the Director, National Sugarcane Institute, Kanpur, was required to be constituted to see how best bagasse could be utilised for paper manufacture.
- (v) The Ministry of Food & Agriculture was required to arrange for a survey to assess the quantity of seaweed available on the coasts and places suitable for seaweed farms.
- (vi) The Central Food Technological Research Institute, Mysore was required to intensify investigations on the utilization of fruit and vegetable wastes, specially mango, banana, papaya, citrus fruits, pineapple, apple, guava, cashewnut, tomato and pea. The need for setting up of a mandarin oil and pectin factory in the then Central India and Coorg and another factory for utilisation of wastes from cashewnut, particularly cashew apple, was also indicated.
- (vii) The Indian Lac Research Institute was required to develop methods of recovery and/or utilisation of lac resin and technical dye from stick lac.
- (viii) The Indian Council of Agricultural Research and State Governments were required to take various steps in order to utilise fully the wastes and by-products from slaughter houses and dead animals. Various measures were suggested for increasing the collection and proper utilisation of bones from fallen animals. The Ministry of Food & Agriculture, All India Khadi & Village Industries Commission and Planning Commission were required to collaborate.
- (ix) It was desired that fish meal industry should be organised on small scale or cottage industry basis through the State Fisheries Departments in order to utilise fully the residues left after extraction of oil from oil sardines, trimmings and other wastes from fish curing yards, trash fish landed

along with quality fish and fish that remained in excess of market requirements or of processing facilities during seasons of glut. This was for particular attention of the States of Kerala, Madras (now Tamil Nadu) and Bombay (now Maharashtra and Gujarat). Liver oil industry was also required to be expanded. The Central Institute of Fisheries Technology and Central Food Technological Research Institute were required to examine whether the liver of skates and rays could be utilized with advantage for oil extraction. The utilisation of heads and shells from the prawn freezing and canning industry for its protein content (which is as high as 30 to 40 per cent on dry basis) and the possibilities of preparing 'smoked bones flakes' from sardine bones were required to be examined. Extensive study was also required to be carried out on the possibility of manufacturing 'pearl essence' from ribbon fish. The possibility of using the skin and scales of other types of fish was also required to be examined. It was recommended that the suggested measures should engage the attention of the Central Institute of Fisheries Technology.

57.3.3 The shortages in respect of raw materials and inputs both for industry and crop production impelled another review of the whole matter and this time it was the National Committee on Science and Technology (NCST), which constituted a Planning Group on the Utilization of Agricultural and Animal Wastes/Byproducts in January, 1973¹. The Group considered the following byproducts and wastes:

rice bran, rice husk; bagasse; molasses and press mud; tobacco: tobacco leaf scrap and stalks and tobacco seed; cotton: cotton stalks, cotton linters, cotton leaves and other plant parts and cotton dust; jute: jute stricks, jute leaves and jute mill wastes; wastes from fruit and vegetable processing industry;

coconut: coir dust, coconut shell and coconut water; arecanut: arecanut husk, leafsheath and leaves and *chogaru* liquid or Kali; cashew; cashewapple, cashew testa and cashew-nut shell liquid; tea; coffee; rubber: rubber seed and rubber wood;

wood wastes; non-edible oilseeds; sisal; lac; and *mohua*

¹1974. Draft Status Report of NCST Planning Group on Utilization of Agricultural and Animal Wastes¹ By products (Research and Development Requirements). New Delhi: National Committee on Science and Technology, Department of Science and Technology, Government of India.

flowers;

cattleshed wastes: cowdung and urine; carcasses of dead and fallen animals: hides and skins, meat, fat, bones, horns and hooves and hair; wool wax;

fisheries: prawns, fish and frog; marine algae.

It has to be recognised that making estimates of the availability of various products and their potential uses based on the existing know-how is the first step and their actual utilisation in industries sufficient to make a perceptible contribution to production is the last. In between the two steps lies the need for feasibility experiments wherever a possibility of utilisation exists. The country has not crossed this very vital intermediate step in many cases and, therefore, the Planning Group felt the necessity of recommending the formation of a large number of working groups to examine certain important aspects in the case of selected products. It has also emphasized the need for preparing status reports in a number of cases.

57.3.4 The National Research Development Corporation of India (NRDC), New Delhi is responsible to promote new patents and inventions and related commercial exploitation. The Planning Group, mentioned in the previous paragraph, compiled a list of NRDC processes relating to the utilisation of agricultural byproducts and wastes as developed by 25 laboratories and institutes in the country. This list is reproduced in Appendix 57.3. The National Committee on Science and Technology (NCST) has also identified a list of 55 viable projects for trials and many of these have already been included in the NCST Science and Technology Plan (1974-75) for implementation. The research institutes involved in the NCST list are about 40. In our view the main difficulty appears to be that of the involvement of a large number of laboratories and institutes because of which the subject of exploitation of by and waste products of agricultural commodities has not crossed the experimental stage, despite the reviews which have been made from time to time since 1957. However, this difficulty will disappear with the creation of the Central laboratory for the industrial utilization of agricultural products. Therefore, viewed in this context also, the case for creation of such a laboratory is greatly strengthened.

4 COMMERCIAL EXPLOITATION OF AGRICULTURAL PRODUCTS

57.4.1 Whereas a lot undoubtedly remains to be done in the utilisation of every bit of agricultural produce in order to add to the prosperity of farmers it is not to be denied that efforts have been

continuously going on to harness various materials in commercial production consistent with the availability of resources and organisational backing. The All-India Khadi & Village Industries Commission, All-India Handloom Board, Handicrafts Board, Central Silk Board and Coir Board are some of the important organisations which have been making appreciable endeavours in this regard. The Small Scale Industrial Development Organisation (SIDO) with the Development Commissioner of Small Scale Industries as its head under the Ministry of Industry & Civil Supplies deals with the activities of agro-based industries and coordinates the same at the Centre. It also controls and coordinates the work of the small industries service institutes and small industries extension centres, which are spread over various parts of India, numbering 32 and 88 respectively. A list of agro-industries within the following broad classification has been prepared by a Joint Group consisting of representatives of the Planning Commission and the then Ministries of Food & Agriculture and Industrial Development, Internal Trade & Company Affairs:

- (i) products of animal and marine origin;
- (ii) products from natural and mineral origin,
- (iii) products from natural and mineral wealth, and
- (iv) inputs required in agriculture and agricultural industries.

57.4.2 We have made a special mention of small scale industries, because it is this sector which can ameliorate the lot of millions of small farmers. We have expressed ourselves in favour of withdrawing women and children from the field operations in Chapter 50 on Farm power specially with a view to employ them gainfully in other avenues, whereby they could brighten their prospects and become useful to their families in supplementing the income. The physically handicapped also require to be properly rehabilitated. Therefore, the extension of cottage industries to every village is an ideal goal worthy of the best possible attention. The concept of a market in every 5 km radius as developed in Chapter 56 on Marketing, Transport and Storage will accelerate the pace of movement of goods from villages to urban areas and, therefore, the handicap which bodies like the All-India Khadi & Village Industries Commission have experienced in popularising their activities will disappear in course of time. The industries in a given region have to be started for the locally available raw materials only. Even some of the minor occupations, examples of which are given below, can provide a lucrative business:

- (i) baskets prepared from twigs of pigeonpea (*arhar* or *tur*), indigenous mattresses known as *chatais* and hand fans known as *pankhas* prepared from the leaves of wild date

(*khajuri*) and sitting contrivances like *mudhas* prepared from the *munj* stalk (*Saccharum* sp.) are all examples of well known goods, but their extent of manufacture can be increased to a very great extent without any danger of glut, because these goods will have an appeal owing to their cheap cost when compared with identical products from other materials;

- (ii) sling bags from sannhemp and jute, if properly designed, can easily replace those prepared from cloth, canvas or other sophisticated material. Such bags will prove less costly and stronger and more durable than others. These can thus become very popular with the householders, students and office goers alike;
- (iii) toys prepared out of plastics and rubber are becoming costlier day by day and this item is such which is in demand in every house. Fanciful toys can very easily be made from various plant parts. If the quality of durability is incorporated in them by treatment with suitable pulp and plaster, these have a tremendous sale potential;
- (iv) arrows of sugarcane and *munj* grass, empty cobs of maize and sorghum heads dyed in attractive colours are already found decorating many a drawing room of upper class people. If these articles could be shaped in different designs and the quality of durability is added to them through some treatment, these could be made to command a much wider appeal;
- (v) table lamps and shades can also be prepared from the various materials of crop origin.

57.4.3 Above are some examples of the simple products in which the rural population can be profitably kept engaged. The SIDO has been devoting attention to a wide variety of other items covering almost every section of the agricultural commodities. It has formulated detailed improved techniques of processing which could be employed effectively in the small scale sector. A list of schemes relating to items of plant and vegetable origin, as proposed by SIDO, is reproduced in Appendix 57.4. About 50 schemes have also been prepared for encouraging industries based on products of animal origin. Thirty to forty of these schemes relate to hides and skins (e.g., sole leather, shoe upper leather, garment leather, gloving leather, shoe lining leather, picking band leather, belting leather, chamois leather; and consumer leather goods like folios, different types of purses, footwear, garments and gloves). Only a small number of schemes deals with crushed bones (for making bone meal, di-calcium phosphate,

gelatin and glue), slaughter house byproducts (blood, intestines, liver, pancreas, hooves and horns, tallow, etc.), hair and wool (bristles in brush and the latter in wool industry), meat, bacon and sausages. It would be obvious that there is enough scope to implement with immediate effect, even without waiting for the research findings of the proposed laboratory for the industrial utilisation of agricultural products. A number of governmental and quasi-governmental agencies are already assisting the development of agro-based industries, e.g., the Director-General of Technical Development (DGTD), the Department of Cooperation through the National Cooperative Development Corporation and the agro-industries corporations of different States. There is also a Central committee which coordinates and promotes the developmental programmes of various agro-industries. On the implementation side, the role of bodies like the All-India Khadi & Village Industries Commission has already been briefly mentioned earlier. Thus the requisite organisational set-up exists even now, but what is pertinent in the new context is a more invigorating drive and a far greater coverage than the past efforts. The marketing of the finished products requires particular attention.

57.4.4 Insofar as big industries are concerned, they are adequately advised and helped by the Central Ministries of Agriculture & Irrigation, Commerce, Industry & Civil Supplies and Petroleum & Chemicals in association with the State Departments of Industry & Civil Supplies. The real difficulty lies in the case of small and medium sectors, which will expand enormously if participation of the rural population in every village is to fructify. Bodies like the All-India Khadi & Village Industries Commission, the All-India Handloom Board, the Handicrafts Board, the Central Silk Board and the Coir Board are already helping small and medium sectors, particularly smaller ones, by providing them financial and material aid and arranging to lift their produce for marketing. There need not be any duplication of the functioning of such bodies, but the industries which are not covered by these should be encouraged or undertaken by the State agro-industries corporations. There is yet another aspect on which the success of full exploitation of agricultural commodities in small and medium scale sectors of the industries depends. This is the developing of appropriate intermediate level technology, which could be adopted in those sectors. The proposed Central laboratory for the industrial utilization of agricultural products will be able to devote attention to this aspect in the normal discharge of its functions.

5 ROLE OF AGRO-INDUSTRIES CORPORATIONS

57.5.1 These corporations have developed as a joint venture between the Government of India and the State Governments. Every major State has by now got an agro-industries corporation. The States of Meghalaya, Nagaland, Manipur and Tripura and the Union Territories and the Centrally administered areas, however, do not have such corporations at present. The details pertaining to these corporations have been discussed in Chapter 50 on Farm Power. It has been recommended by us in that Chapter that these areas should be served by the existing agro-industries corporations of the neighbouring States. A prominent feature common to all the corporations relates to the supply of farm machinery and implements, particularly tractors and associated machinery. Besides this main activity, many corporations have been undertaking various jobs in the field of processing too. Processing of seed and its supply to farmers are being attended to by the corporations in Bihar, Karnataka, Maharashtra and West Bengal. The Agro-Industries Corporation of Haryana undertakes the manufacture of malt and flour milling. The Corporation in Andhra Pradesh has been considering the starting of freeze drying of mango and prawns, manufacture of edible grade gram flour and protein concentrate and processing of maize and castor beans. The Karnataka Agro-Industries Corporation has under consideration plans for the manufacture of chilly extract, liquor and *feni* from cashew apple, tamarind seed meal, cotton seed and groundnut protein concentrate, rice bran products, tomato seed oil, gluten and dextrin from maize, grape juice and lucerne extract. The Gujarat Corporation has set up many subsidiaries like the Agro-Oil Enterprises Limited and the Agro-Marine Products Limited. They even propose to go in for the culture of pearls and edible oysters. The agro-industries corporations of Andhra Pradesh, Assam, Gujarat, Haryana, Karnataka, Maharashtra and Uttar Pradesh have established fruit processing units.

57.5.2 Although there is a tendency on the part of the State agro-industries corporations to undertake multifarious activities including manufacture of various kinds, there is no common pattern or principle as in the case of farm machinery and implements. We are of the opinion that the agro-industries corporations can play a very useful role by participating in the processing and manufacturing activities relating to agricultural products. A common pattern should be developed to be followed by corporations for undertaking the following activities with varying emphasis on the different activities according to the needs of different States:

- (i) agricultural processing industry in general,

- (ii) preservation industry relating to perishable commodities like fruits, vegetables, meat and fish, and
- (iii) selected agro-based industries.

The second important principle which has to be observed by the agro-industries corporations in deciding upon participation in the above ventures is that they should not act as competitors to private entrepreneurs or cooperative organisations. Their aim should be to function in fields which are not covered by any other party. Wherever other parties exist, corporations should render all possible help to them in order to promote their activities. This applies particularly to the entrepreneurs and cooperatives in the small and medium scale sectors. It should be a special responsibility of the agro-industries corporations to ensure that agro-processing activities spread in the inaccessible areas. They should take direct responsibility for establishing such industries in these areas.

57.5.3 We envisage for the agro-industries corporations the functions of manufacture, supply and services on a uniform pattern throughout the country. As a part of this policy, it should be their responsibility to make arrangements for the disposal of the industrial products manufactured in the small and medium sectors under their patronage. This is very important because small scale producers often find it difficult to dispose off their products and, therefore, they gradually give up production. There should be arrangements with the corporations to purchase the produce from such manufacturers and arrange for sales.

57.5.4 There would be need for a coordinating body to develop and harmonise the agro-processing activities and avoid duplication among various other organisations like the All India Khadi & Village Industries Commission, All-India Handloom Board, Handicraft Board, Central Silk Board and Coir Board on the one hand and the agro-industries corporations on the other. This could be done at the Central level under the aegis of the Ministry of Agriculture & Irrigation.

6 SUMMARY OF RECOMMENDATIONS

57.6.1 The recommendations made in this Chapter are summarised below:--

Processing

1. In order to build up a good export market in processed fruit and vegetable products, a constant watch should be kept over the

kinds of commodities required, the form of preservation preferred and the taste sought for in different countries.

(Paragraph 57.1.4)

2. In commercial dehydration of vegetables, tuber crops require special attention and among the tuber crops potatoes need particular attention. Big dehydration plants should be installed in the immediate vicinity of markets where wholesale transactions take place so as to avoid delays and save time and money in transport.

(Paragraph 57.1.5)

3. Tin plate of low phosphorus content suitable for canning purposes should be manufactured in the country and made available to can fabricators at reasonable cost. Until local manufacture becomes possible, sufficient imports of this kind of tin plate should be allowed to meet the requirements of the canning industry whether the product is meant for export or internal consumption.

(Paragraph 57.1.10)

4. The cost of tin can should be kept within reasonable limits by reducing the charges levied on imports. There is also a case for reducing the ex-factory price of the canned or bottled product through concessions in taxes.

(Paragraph 57.1.10)

5. Glass manufacturers should be kept within reasonable limits by jars of required quality.

(Paragraph 57.1.11)

6. Research is required to be expedited for producing plastic containers suitable for use in the preservation industry.

(Paragraph 57.1.12)

7. Sugar should be made available to fruit preservation industry on controlled rates uniformly irrespective of the fact whether the product is meant for export or otherwise.

(Paragraph 57.1.13)

8. It is necessary to enforce compulsory grading of fruits and vegetables in markets according to the already available ISI standards so that right quality of these items become available to the processing industry.

(Paragraph 57.1.13)

9. Research is needed to determine whether the processed food articles which are in contact with preservatives and tin or plastic containers are safe for habitual users and if not what type of containers have to be developed. It is desirable to determine the microbial and hygienic standards which should apply to fruit and vegetable preservation industry in the country. It is also necessary to determine at

what levels sulphur is injurious in jams and the specifications should accordingly lay down, these levels rather than insist upon the product to be completely free of this element.

(Paragraph 57.1.14)

10. The feasibility of utilizing broilers and culled birds needs to be determined for canning industry.

(Paragraph 57.1.15)

11. There is need to establish in towns and rural areas manufacturing units to produce bakery and confectionery articles of daily use under hygienic conditions.

(Paragraph 57.2.2)

12. Use of millets and pulses in suitable blends needs to be developed for making bakery and confectionery products.

(Paragraph 57.2.3)

13. The equipment use in the preparation of various kinds of parched products from cereals and millets needs to be modernised.

(Paragraph 57.2.3)

14. Various millet grains could be tried for starch making. These foodgrains could also be utilised for the preparation of glucose syrup. Steep water obtained from the wet milling of maize and jowar requires to be tried as a nutrient medium for the culture of micro-organisms in antibiotics industry.

(Paragraph 57.2.4)

15. Various foodgrains should be utilized for the separation of certain of their chemical ingredients, which have potentialities in industry.

(Paragraph 57.2.4)

16. The preparation of malt syrup and other malted products requires to be stepped up by establishing more manufacturing units. This equally applies to beer manufacture and for this purpose the indigenous cultivation of hop (*Humulus Sp.*) has to be encouraged.

(Paragraph 57.2.5)

17. Carbon-dioxide which is obtained as a by-product of the fermentation industry could be used for preservation purposes either in gaseous form by providing an inert atmosphere or in the form of dry ice which lowers the storage temperature.

(Paragraph 57.2.6)

18. The exploitation of pulses for preparing protein concentrates and isolates needs attention. It is also worth considering whether India could not manufacture gum from guar and export this finished commodity rather than trading in the raw material. This recom-

mentation applies to other gum yielding plants as well.

(Paragraph 57.2.7)

19. The manufacture of golden syrup rich in glucose should be attempted from sugarcane crop of tender age.

(Paragraph 57.2.8)

20. Soyabean proteins and oil could be exploited for various purposes. The manufacture of vegetable milk from soyabean and groundnut should also engage attention.

(Paragraph 57.2.9)

21. All tuber crops require to be exploited for the manufacture of industrial starch. Preparation of industrial starch and sago has to be particularly encouraged in all the tapioca growing States because of the low keeping quality of this tuber and also because sago has greater potentiality of utilization. It is expected that the cost of starch manufacture would go down with the increase in production in future. When this happens, possibility of exporting industrial starch could be explored.

(Paragraph 57.2.10)

22. The manufacture of products like garlic powder, alcoholic and non-alcoholic beverages and oil and oleoresins from ginger, flavouring constituents from turmeric rhizomes etc., could be encouraged.

(Paragraph 57.2.11)

23. Suitable restrictions should be imposed on the export of raw medicinal and aromatic plants. The processing of such material should be encouraged in the country itself and the manufactured product exported.

(Paragraph 57.2.13)

24. There should be a Central laboratory for industrial utilisation of agricultural products under the aegis of the ICAR with the status of a National laboratory. The scope of research work of this laboratory should cover all the branches of agriculture and its main objective should be to examine the main products, by-products and waste products of each of the agricultural commodities in order to advise the Government and industries of their feasibility for commercial exploitation. The laboratory should avoid duplication with other specialised institutes and to achieve this objective, it should maintain proper coordination with them. In order to share its work, small technological units are also required to be created in the agricultural universities and Central institutes of the ICAR.

(Paragraphs 57.2.21 and 57.3.4)

25. The agro-industries corporations should participate in pro-

cessing and manufacturing activities relating to agro-based products on the basis of common pattern applicable throughout the country. The spheres of activities could be: (a) agricultural processing industry, (b) preservation industry relating to perishable commodities and (c) selected agro-based industries.

(Paragraph 57.5.2)

26. The agro-industries corporations should not compete with private entrepreneurs or cooperative enterprises but should render all possible help to such units particularly those functioning on a small or medium scale. The corporations should take up those activities which have not been covered by other units. It would be a special responsibility of the corporations to ensure that agro-processing activities spread in inaccessible areas. They should take direct responsibility for establishing such industries in these areas.

(Paragraph 57.5.2)

27. The agro-industries corporations should shoulder direct responsibility to make arrangements for purchase of the products manufactured by units in small and medium sectors operating under their patronage and the sale thereof.

(Paragraph 57.5.3)

28. A coordinating body should be set up under the aegis of the Ministry of Agriculture & Irrigation at the Centre to develop and harmonise agro-processing activities and avoid duplication among various organisations like the All India Khadi & Village Industries Commission, the All India Handloom Board, the Handicraft Board, the Central Silk Board and the Coir Board on the one hand and the agro-industries corporations on the other.

(Paragraph 57.5.4)

APPENDIX 57.1

(Paragraph 57.1.8)

India's Exports of Fruits and Vegetables Preparation
(average 1967-68 to 1971-72):

Article	Quantity	Value	Major importers (countries)	Quantity—tonnes	Value—Rs. lakhs
Mango slice dried . . .	45.7	1.6	Hong Kong, UK, Qatar, Singapore, Federal Republic of Germany		
Other tropical fruit dried .	28.7	1.0	Singapore, UK, Kuwait, Yugo- slavia		
Mango jams . . .	272.8	7.4	UK, USA, Saudi Arab, Kuwait, Canada, Aden, Qatar, USSR, Federal Republic of Ger- many		
Other jams . . .	59.5	1.5	UK, Singapore, Kenya, Federal Republic of Germany, USSR		
Mango Juice . . .	5147	125.5	USSR, Saudi Arab, Kuwait, Bahrein Islands, Qatar, Oman, Somalia, UK		
Other juices . . .	509.1	9.7	UK, USSR, Qatar, Oman, Kuwait		
Fruit preserved by freezing with sugar	11.3	0.5	Yugoslavia, Nepal		
Mango slice brine . . .	504.1	9.3	UK, Netherlands, New Zealand, Somalia, Federal Republic of Germany		
Other fruit temporarily pre- served	340.3	3.2	UK, USA, Yugoslavia, Qatar, Kuwait, USSR		
Fruit preserved in syrup NES*	235.5	7.9	UK, USA, Bahrein Islands, Canada, Singapore USSR		
Other preserved in syrup .	44.2	2.8	Nepal, Federal Republic of Germany, Bulgaria		
Mango chutney, pickles with sugar	1279.8	40.7	UK, USA, Singapore, Nether- lands, Canada, Federal Republic of Germany, Japan, Hong Kong		
Mango chutney, pickles without sugar	607.9	16.5	UK, Iraq, Canada, Saudia Arabia, Singapore, Somalia, USA, Kuwait		

APPENDIX 57.1 (Contd.)

Article	Quantity	Value	Major importers (countries)
Others . . .	676.5	25.6	UK, USA, Nepal, Kuwait, Singapore, Australia, Bahrain Islands, Canada
Vegetables in air-tight container	69.8	2.7	UK, Qatar, Oman, Canada, Bahrain Islands, Tanzania, Mauritius
Vegetable preserved or prepared NES	91.5	2.2	UK, Tanzania, Qatar, Canada
Fruit in air-tight container	22.4	0.7	Japan, UK
TOTAL . . .	9946.2	258.8	

¹Monthly Statistics of the Foreign Trade of India, Vol. I Exports and Re-export
March 1968, March 1969, March 1970, March 1971 and March 1972.

²NES=not elsewhere specified.



APPENDIX 57.2

(Paragraph 57.2.1)

Broad Categories of Industries Already Established

1. rice polishing & parboiling
2. flour
3. bread, biscuits and other products from flour
4. flakes (using corn, wheat and rice-pohe or chuda)
5. processed barley and oat products
6. splitting the pulses into *dals* and their processing
7. protein biscuits (blackgram, soyabean) (a)
8. malt (barley, ragi) (b)
9. gum (*guar-Cyamopsis sp.*, tamarind seed, psyllium—*Plantago sp.*, *Karaya-Sterculia sp.*) (c)
10. industrial starch (maize, tapioca) (d)
11. oils (oilseeds from field crops, rice bran, cotton seed, oil bearing trees and shrubs, coconut) (e)
12. hydrogenated oil
13. sugar, gur and khandsari sugar for sugarcane (f)
14. yeast (molasses)
15. distillery products (molasses, cereals)
16. tobacco products (cigarette, *bidi*, etc.)
17. cotton yarn and fabrics
18. woollen yarn and fabrics
19. jute goods
20. coir goods
21. canned fruits, vegetables, meat, fishery products
22. tea
23. coffee
24. rubber (dipped rubber goods, toys, balloons, nipples etc., tyres and tubes of various kinds; beltings; latex foam sponge)
25. cashew kernels (g)
26. cocoa (C hocolates, drinking chocolate or coco powder, confectionery articles)
27. milk products (butter, ghee, paneer & khoya, sweetened condensed milk, milk powder, malted milk food, confectionery)
28. hides and skins
29. sawn wood
30. plywood
31. cork sheets, discs, stoppers
32. newsprint and various kinds of papers and boards
33. matches
34. turpentine oil
35. rosin
36. lac
37. paints and varnishes
38. soap
39. footwear (cloth, rubber and leather)
40. waterproof fabrics
41. leather cloth
42. silk fabrics
43. livestock feed

Note

- (a) groundnut cake can also be tried.
- (b) other millets can also be exploited.
- (c) mucilaginous seeds of many other plants can be exploited, e. g., *dhaincha (Sesbania sp.)*.
- (d) potato, tamarind seed, pseudostem of banana are some of the other materials for starch manufacture.
- (e) oil palm is a new promising source; maize, bajra, some small millets, rice, bran, cotton seed and oil bearing trees and shrubs may be exploited fully.
- (f) sugarbeet is a new promising source.
- (g) cashew shell liquid and testa tannia also show promise for exploitation

APPENDIX 57.3

(Paragraph 57.3.4)

Institute-wise List of National Research Development Corporation (NRDC)
Processes relating to the utilization of Agricultural and Animal Wastes

I. Regional Research Laboratory, Jorhat.

1. Caffeine from tea waste.
2. Furfural from agro-industrial wastest.
3. Oxalic acid from sawdust and molasses.
4. Baker's Yeast from molasses.
5. Bromalin from pineapple waste.
6. Tartaric acid from tamarind leaves.
7. Cystin from hair.
8. Household detergent, silica flour and bricks from paddy husk.
9. Particle board from wood waste without binder.
10. Production of moulded products from agro-industrial wastes.

II. Regional Research Laboratory, Hyderabad.

1. Activated carbon from rice husk.
2. Activated carbon from coconut shells.
3. Distillation of cashewnut liquid to cardenol and fermentation of different composition products for various end-uses.
4. Chemical cotton from cotton linters.
5. Speciality paper from cotton linters and hosiery wastes and agro-wastes.
6. Fatty acids from cotton seed soap stock.

III. Regional Research Laboratory, Bhubaneswar

1. Hecogenin from sisal waste.
2. Oxalic acid from tobacco wastes.
3. Production of alcohol from *mahua* flowers.
4. Economic products from marine wastes, viz., prawns, crabs and trash fish.

IV. Regional Research Laboratory, Jammu.

Particle boards from agro-industrial wastes.

V. National Chemical Laboratory, Poona.

1. Tamarind Kernel powder phosphate (TKPP) and borate.
2. Cashewnut shell gum.
3. Gum arabic substitute from tapioca starch.
4. Sugarcane wax.

APPENDIX 57.3 (Contd.)

5. Nicotine sulphate from tobacco wastes.
6. Extraction and utilisation of sisal wax.
7. Rubberised cork sheet from waste cork granules.
8. Gaskets from coir pith.

VI. National Botanic Gardens, Lucknow.

Separation and utilisation of Lipid Associates from non-edible oilseeds.

VII. National Sugarcane Research Institute, Kanpur.

1. Lactic acid and exalic acid from sugarcane molasses.
2. Extraction and purification of sugarcane wax from press mud.

VIII. Central Food Technological Research Institute, Mysore.

1. Starch from mango seeds and kernels.
2. Oil and protein from peels of oranges and lime.
3. Pectin, cider and vinegar from apple pomace.
4. Syrup and vinegar from pineapple wastes.
5. Starch and fibre from banana pseudostems.
6. Pectin and tartarate from tamarind fruit pulp.
7. Tamarind juice concentrates.
8. Papain and pectin from papaya wastes.
9. Beverages from cashew apples.
10. Stabilisation of and oil extraction from rice bran.

IX. Central Leather Research Institute, Madras.

1. Leather boards from leather waste.
2. Utilisation of acid washing, scouring, bleaching and softening of tannery, goat hair, wool, buff and camel hair.
3. Processing of dry, ready to eat sausage casings from cattle, goat, sheep, pig and other mammalian intestines.
4. Manufacture of hide powder.
5. Manufacture of tannin extracts using cashew testa.
6. Violin bowhair.
7. Pig/hog bristles.
8. Tanain extract from tamarind seed husk.
9. Surgical sutures from mammalian intestines.

X. Central Building Research Institute, Roorkee.

1. Expansion joint filler from CNSL and coconut.
2. Water and weather proofing resin composition based on CNSL.
3. Cement coconut pith concrete for thermal insulation.
4. Wood wool board.
5. Coconut husk particle board.

APPENDIX 57.3 (Contd.)

XI. Central Fuel Research Institute, Jealgora.

Activated carbon from coconut shell.

XII. Central Salt and Marine Chemicals Research Institute, Bhavnagar.

1. Agar agar from Indian seaweeds.
2. Algenic acid and sodium alginate from Indian seaweeds.

XIII. Central Institute of Fisheries, Technology, Cochin.

1. Chitesan from prawn wastes.
2. Fish meal from fish wastes.

XIV. Indian Agricultural Research Institute, New Delhi.

1. Manure from leather wastes.
2. Manure from hair and wool wastes.
3. Sterilized bonemeal from cattle bones.
4. Bloodmeal from slaughter house blood.

XV. Indian Lac Research Institute, Namkum.

Lac Wax from lac effluents.

XVI. Indian Institute of Petroleum, Dehradun.

Lanolin from wool grease.

XVII. Indian Institute of Paper Technology, Saharanpur.

1. Pulping of rice straw by neutral sulphite, semi-chemical process for bleachable grade pulp for M/s Rohit Pulp and Paper Mills Ltd., Gujarat.
2. Pulping of wheat straw by neutral sulphite semi-chemical process for the manufacture of Linearboard for M/s Straw Products, Bhopal.
3. Pulping of wheat straw, paddy straw and bagasse by mechano-chemical and pressure digestion processes from M/s Dhampur Sugar Mills Ltd., Dhampur.

XVIII. Technological Research Laboratory, Calcutta.

1. Pulp, paper, viscose rayon and laquor varnish from jute.

XIX. Forest Research Institute, Dehradun.

1. Paper from jute stick.
2. Pure catechin from khair trees.
3. Distillation oil from the saw dust of *Eucalyptus citrildorum*.

APPENDIX 57.3 (Concl'd.)

XX. Oil Technological Research Institute, Anantpur.

Bleaching of crude rice bran oil.

XXI. Research Design and Standards Organisation, Chittaranjan.

1. Epoxy resin from cashewnut shell liquid.
2. Resin emulsion from cashewnut shell liquid.
3. Phosphated products of CNSL/CNSL resins. BNSL/BNSL resins.

XXII. Jadavpur University, Calcutta.

Stabilisation of both raw and parboiled bran.

XXIII. Industrial Testing Research Laboratory, Trivandrum.

1. Chemistry of tannin and nontannins of cashew testa.
2. Chemistry and uses of cashewnut shell liquid.

XXIV. Wool Research Association, Bombay.

Recovery of wool wax from scour liquor.

XXV. J. B. Central Research Institute for village Industries, Wardha

1. Preparation of sterile bonemeal from bones.
2. Preparation of dicalcium phosphate from bones.
3. Recovery of bone glue in pure grade.

APPENDIX 57.4

(Paragraph 57.4.3)

Scheme of Agro-Industries prepared by Small Scale Industries Development Organisation***Part I**

1. Absolute Alcohol from Molasses
2. Banana Figs
3. Banana Powder
4. Banana Pseudostem
5. Pineapple Fibre
6. Bakery Products (Semi-mechanised)
7. Cattle Feed
8. Condensed Milk
9. Desiccated Coconut—Processing
10. Chicory Powder—Processing
11. Card Board from Bagasse
12. Corrugated Paper Board
13. Caffeine from Tea Waste
14. Dehydrated Fruits, Vegetables and Soup Powders
15. Expansion Joint Filler from Cashew Shell Liquid and Coconut Pith
16. Fruit and Vegetable Preservation (Orange and Tomato Products)
17. Fruit Preservation (General)
18. Ginger and Ginger Products
19. Grape Products—Processing
20. Khandsari Sugar by open Pan Process
21. Crushing of Oil Seeds and Refining of Oils
22. Papain and Pectin from Raw Papaya
23. Dehydrated Potato Chips
24. Poultry Feed
25. Rice Bran Oil

*Schemes on Agro-Industries, Vol. I, Part I (published 1968) and Part II (cyclo-styled 1972). New Delhi Development Commissioner Small Scale Industries Ministry of Industrial Development, Government of India.

APPENDIX 57.4 (Contd.)

26. Ragi Malt Food
27. Rope and Ban Making
28. Saw Dust Briquettes as Domestic & Industrial Fuel
29. Straw Boards
30. Surgical Bandages
31. Saponin from Soap Nuts
32. Splints & Veneers
33. Starch from Tamarind Seeds
34. Potato Starch
35. Vermicelli
36. Vegetable Milk/Curd from Groundnuts

Part II

1. Absorbent cotton (surgical cotton)
2. Apple & Allied Juices
3. Baker's Yeast
4. Beer
5. Beverages carbonated (Aerated water)
6. Biscuits
7. Biscuits (Mechanised)
8. Bread white
9. Capsicum oleoresin
10. Card Board Boxes & Cartons
11. Confectionery
12. Corrugated Board & Rolls etc.
13. Filter Tips (cigarettes)
14. Fruits and Vegetables (Bottled)
15. Hard Liquors (Brandy, Whisky & Rum etc.)
16. Ice Cream
17. Lactic Acid
18. Laminated Paper (PVC/Polythene)
19. Log Wood Processing & Furniture making.

APPENDIX 57.4 (Concl'd.)

20. Matches (Hand made)
21. Nuts Processing (Roasted & Salted)
22. Oxalic Acid
23. Paper Cones & Tubes
24. Particle Board from Groundnut sheets
25. Potato Flour
26. Processing of Fruits and Vegetables
27. Ready Made Garments
28. Socks (Nylon)
29. Socks (Woollen)
30. Spices
31. Tissue paper
32. Vests (Interlock Cotton)
33. Wood Seasoning and Saw Mills

